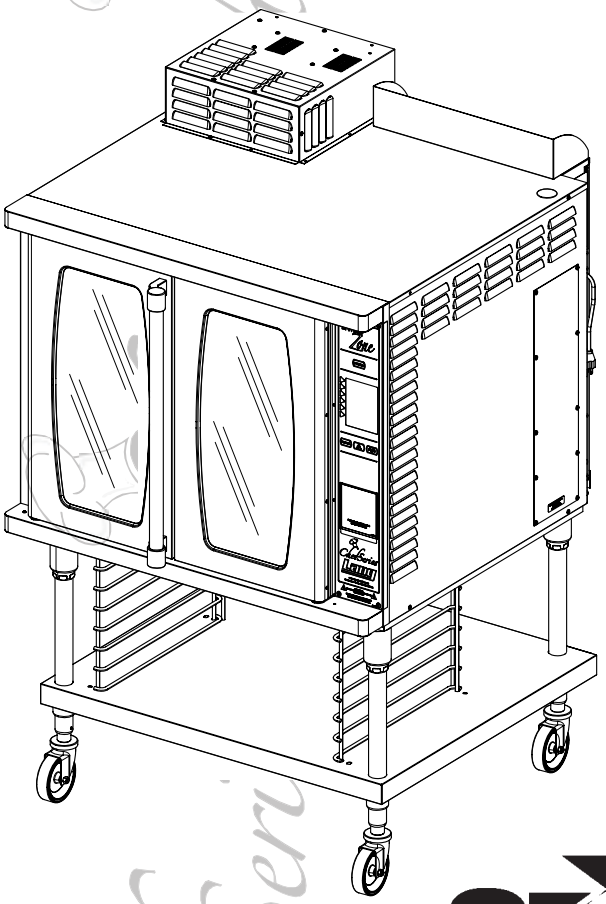
Lang™

A Division of Star Mfg. Int'l, Inc.

GAS FULL SIZE COMPUTERIZED CONVECTION OVEN

Enviro-STAR (GCSF-ES)

Service Manual



2M-W1345 Rev. - 08/01/08

STAR®

INTERTEK ETL LISTED c US

These symbols are intended to alert the user to the presence of important operating and maintenance instructions in this manual.

IMPORTANT FOR YOUR SAFETY

THIS MANUAL HAS BEEN PREPARED FOR PERSONNEL QUALIFIED TO INSTALL GAS EQUIPMENT, WHO SHOULD PERFORM THE INITIAL FIELD START-UP AND ADJUSTMENTS OF THE EQUIPMENT COVERED BY THIS MANUAL.

POST IN A PROMINENT LOCATION

THE INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE SMELL OF GAS IS DETECTED. THIS INFORMATION CAN BE OBTAINED FROM THE LOCAL GAS SUPPLIER.

⚠ WARNING!

IN THE EVENT OF A POWER FAILURE, DO NOT ATTEMPT TO OPERATE THIS DEVICE.

⚠ WARNING!

IN THE EVENT A GAS ODOR IS DETECTED, SHUT DOWN UNIT AT THE MAIN SHUTOFF VALVE AND CONTACT THE LOCAL GAS COMPANY OR GAS SUPPLIER FOR SERVICE.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

⚠ WARNING!

IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE, OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY, OR DEATH.

READ THE INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE OPERATING THIS EQUIPMENT.

⚠ WARNING

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE THE CONTROL PANEL. THERE ARE NO USER-SERVICABLE PARTS INSIDE. REPAIRS SHOULD BE MADE BY AUTHORIZED SERVICE PERSONNEL ONLY.

NOTICE

Using any part other than genuine Lang factory supplied parts relieves the manufacturer of all liability. Lang reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions, or replacements for previously purchased equipment.

Due to periodic changes in designs, methods, procedures, policies, and regulations, the specifications contained in this document are subject to change without notice. While Lang Manufacturing exercises good faith efforts to provide information that is accurate, we are not responsible for errors or omissions in information provided or conclusions reached as a result of using the specifications. By using the information provided, the user assumes all risks in connection with such use.

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INTRODUCTION

GENERAL

Lang Gas Convection Ovens are manufactured for use with the type of gas indicated on the data plate (natural gas or propane). Variations exist between models. This manual details typical servicing procedures that would apply to most, but not all, of the listed models.

INSTALLATION

Refer to the Installation and Operation Manual.

OPERATION

Refer to the Installation and Operation Manual.

CLEANING

Refer to the Installation and Operation Manual.

TOOLS

- Standard set of hand tools
- Gas leak detection equipment
- Gas pressure manometer

WATER QUALITY REQUIREMENTS

Water line pressure and quality MUST meet the Lang Manufacturing Specifications listed below.

Contact your local water equipment system provider to assist you in determining your specific water quality, or contact Lang Technical Support for assistance, 1-800-807-9054.

-IMPORTANT-

LOCAL WATER CONDITIONS MAY DAMAGE LANG EQUIPMENT. FAILURE TO PROPERLY TREAT WATER MAY RESULT IN DAMAGE AND MAY VOID SOME OR ALL OF THE WARRANTY.

WATER SPECIFICATIONS: After treatment, the water must continuously be within the following parameters:

Cold Water	
Minimum GPH	3
PSI	20 to 80
PH	6.8 to 7.6
Hardness	2 to 4 grains/gallon
Total Dissolved Solids	<100 PPM
Conductivity	<1/500,000 Ohms/in.
Maximum Salinity Ion Content	
Chloramines	<0.5 PPM
Chlorine	<0.5 PPM
Chlorides	<30 PPM
Copper	<0.05 PPM
Iron	<0.1 PPM
Manganese	<0.05 PPM
Sulfates	<40 PPM

SPECIFICATIONS

Model	Height × Width x Depth	Clearance From Combustible Surfaces	Weight Installed	Weight Shipping	Freight Class
GCSF-1	36″ × 40″ × 40″ (91.4cm × 101.6cm × 101.6cm)	Side:0″, Back:1″, Floor:4″	555 lbs. (252 kg)	620 lbs. (281 kg)	70
GCSF-2	74″ × 40.4″ × 40″ (188cm × 102.6cm × 101.6cm)	Side:0″, Back:1″, Floor:4″	1110 lbs. (503 kg)	1240 lbs. (562 kg)	70

UTILITY REQUIREMENTS

Model	Voltage	Total kW	Phase	Amps/Line	Total Gas Req.
GCSF-1	120V/60Hz	0.7	1	5.8	1/2" NPT, 60,000 BTU/hr
GCSF-2	120V/60Hz	1.4	1	11.6	1/2" NPT, 120,000 BTU/hr

DESCRIPTION

CONVECTION OVEN BASICS

A convection oven is an electro-mechanical, sealed-type of oven in which the combustion products are separated from the air inside the oven. Heated air is circulated by a fan into the oven and over the food product, removing a thin layer of moisture from the food and allowing heat to penetrate.

This method requires shorter cooking times at lower temperatures and produces consistent results, which may vary due to differences in preparation rather than in oven operation.

Steam in the cooking process prevents the removal of all the moisture during baking and produces a better product. And when applied to bread dough during the first five minutes, it allows yeast to work longer producing better spring and volume and a moist, flexible outer surface. Once the outside layer of dough sets, gases in the loaf no longer expand to increase loaf size.

Steaming bread dough as it bakes gelatinizes starch on the outer layer and prevents the crust from cracking. However, too much steam results in an undesirable crust. During the last stages of baking, a dry oven is needed to produce a crisp, brown crust.

Times and temperatures may vary due to factors such as food quality and quantity, type of pan and thermostat calibration. Differences in altitude will also affect cooking times and temperatures.

Time & Temperature Conversion: To convert standard oven recipes for use in a convection oven, reduce cooking temperature by 25° F – 75° F and the time by 25% – 35%.

Fan Speeds: The convection fan can be set for HI or LOW speed. Most baking is done on HI, but delicate products (i.e., Meringue pie) require a LOW fan setting.

COMPONENT OPERATION

Electrical Power Circuit

The operating voltage (120 VAC) is routed from the power source to a terminal block.

NOTICE: See the wiring diagrams in the Troubleshooting section.

The AC line is connected through a 15 Amp fuse (F7) to a contact on the motor relay (MR2), interior light relay (LR1), and the primary winding of a step-down transformer (T1).

The transformer provides 24 VAC through the circuit board to control the oven electrical components.

Thermostat Operation

The thermostat maintains oven temperature at the desired setting. A sensor (Figure 1) mounted inside the oven monitors oven temperature. The unit is equipped with both:

- a mechanical thermostat
- a programmable temperature controller.

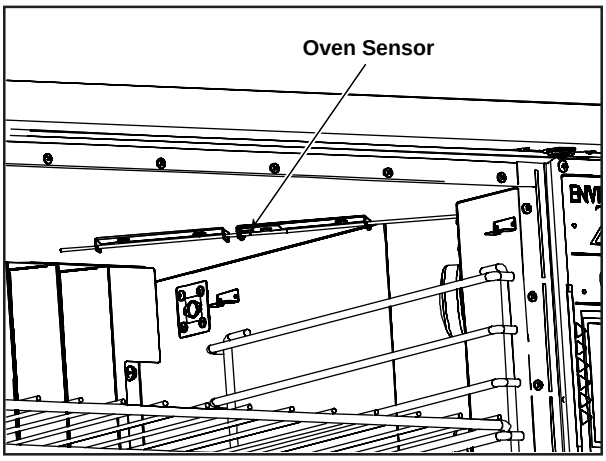


Figure 1: Oven Sensor

When the operator selects a temperature setting or the product to bake, the oven is heated until the temperature reaches the selected setting. The controls circuit monitors the temperature sensor and activates the ignition control module to ignite the burner when heat is required.

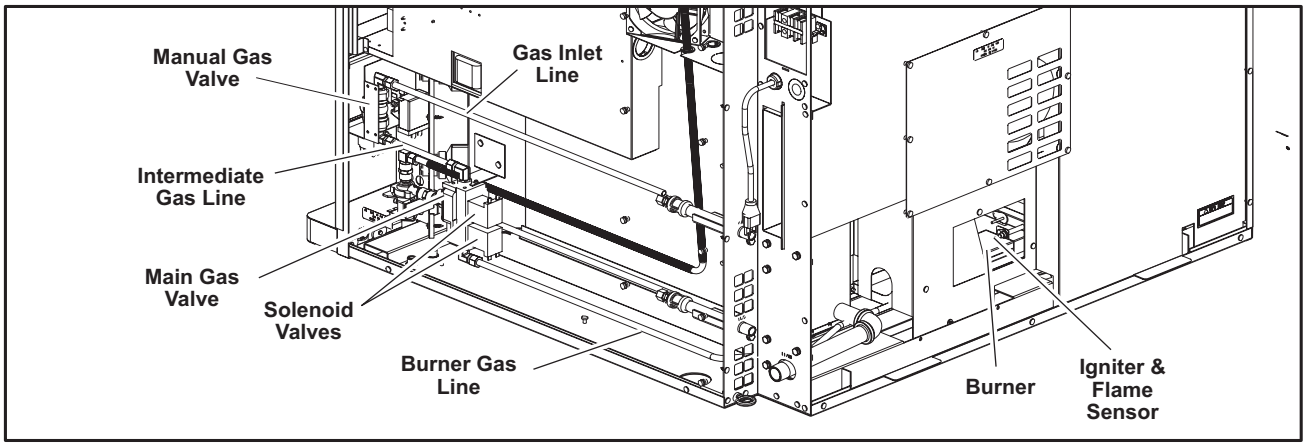


Figure 2: Gas Flow Diagram

Gas Flow and Ignition

Natural gas is supplied through the manual gas valve (Figure 2) to the main gas solenoid. When the temperature is selected the ignition control module activates the igniter and opens the gas solenoid. Gas flows to the burner and the igniter lights the flame. The ignition control module monitors the flame sensor to determine if the burner is on. If the burner does not ignite, the solenoid valve closes shutting off gas flow to the oven.

Ignition System

The igniter module controls ignition of the burner gas. The module monitors burner ignition, heat and shut down.

SPECIFICATIONS:

Fenwal 35-66 Series Igniter Module

INPUT POWER	
Voltage	**Control:** 18 to 30 VAC 50/60 HzLine: 24 VAC
Current	300 MA @ 24 VAC with fan and gas valve relay energized
OUTPUT POWER	
Gas Valve	2.0A max @ 24 VAC
OPERATING TEMPERATURE	-40°F to +175°F (-40°C to +80°C)
FLAME SENSITIVITY	0.7 micro amps (minimum)
IGNITER	24 VAC
Trail for Ignition	7 Seconds
Inter-Purge	15 Seconds
Pre-Purge	15 Seconds
Tries for Ignition	3 Tries with 1 Hour Automatic Reset
Post Purge	None
Options	None

NOTE: *Follow the wiring diagram and gas flow chart to better understand the ignition description.*

The oven ignition and control system operates on 120 and 24 VAC. When the power switch is placed in the ON position, 120 VAC is routed through fuse F7 (15A). The voltage from the fuse is routed to one side (incoming) of a 24 VAC transformer (Figure 3). The other side of the transformer (incoming) is connected to a neutral input.

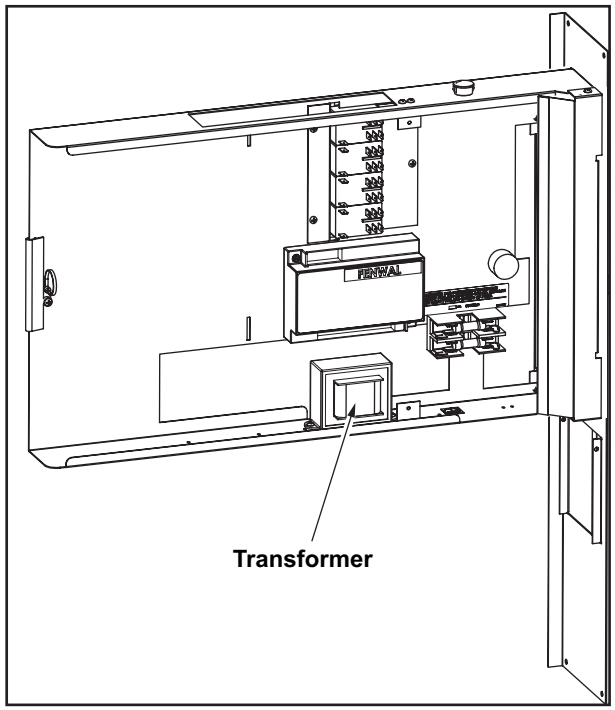


Figure 3: Transformer

The transformer converts the 120 VAC to 24 VAC and routes the 24 VAC through the outgoing side through a back-up switch, a back-up thermostat switch and an over-temperature switch to the ignition controller pin W.

The ignition control module (Figure 4) operates on 24 VAC at pin W provided by the transformer. The module controls the main gas solenoid and the igniter.

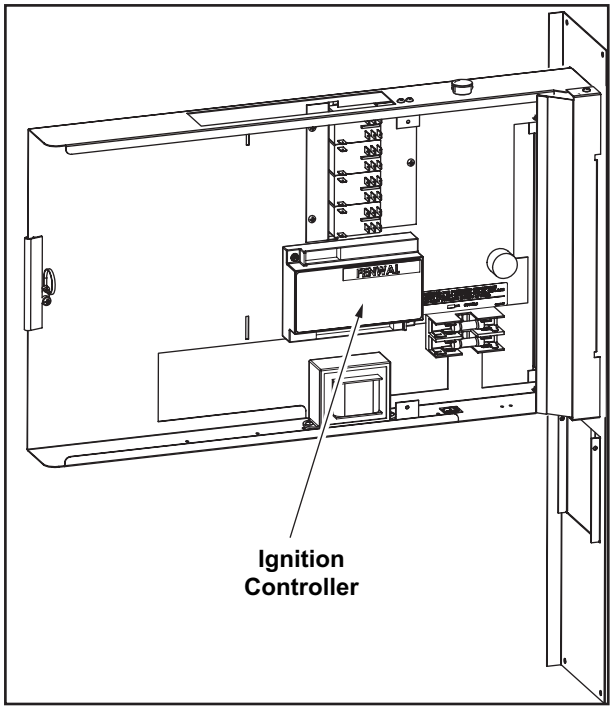


Figure 4: Ignition Control Module

When the power switch is placed in the ON position and a temperature is selected using the temperature knob a call for heat is generated in the controller.

- The controller performs a self check routine.
- The diagnostic LED flashes for one second.
- A safety timing sequence begins.
- The controller performs a 15-second pre-purge of the system.
- The controller must detect that the air switch is working properly, before it energizes the igniter and the surface of the igniter tip heats up.
- The main gas valve solenoids open allowing gas to flow to the burner.
- The gas in the burner is ignited by the igniter tip.

A TFI (trail for ignition) period checks the flame sensor for evidence of a flame at the burner. If flame does not ignite within 7-seconds the control module closes the main gas valve solenoids and gas stops flowing to the burner.

When a flame is detected, voltage to the igniter stops and the igniter cools. The thermostat, pressure switch and burner flame are monitored for proper operation. When the selected temperature is reached voltage stops flowing to the main gas valve solenoids (Figure 5) and gas stops flowing to the burner.

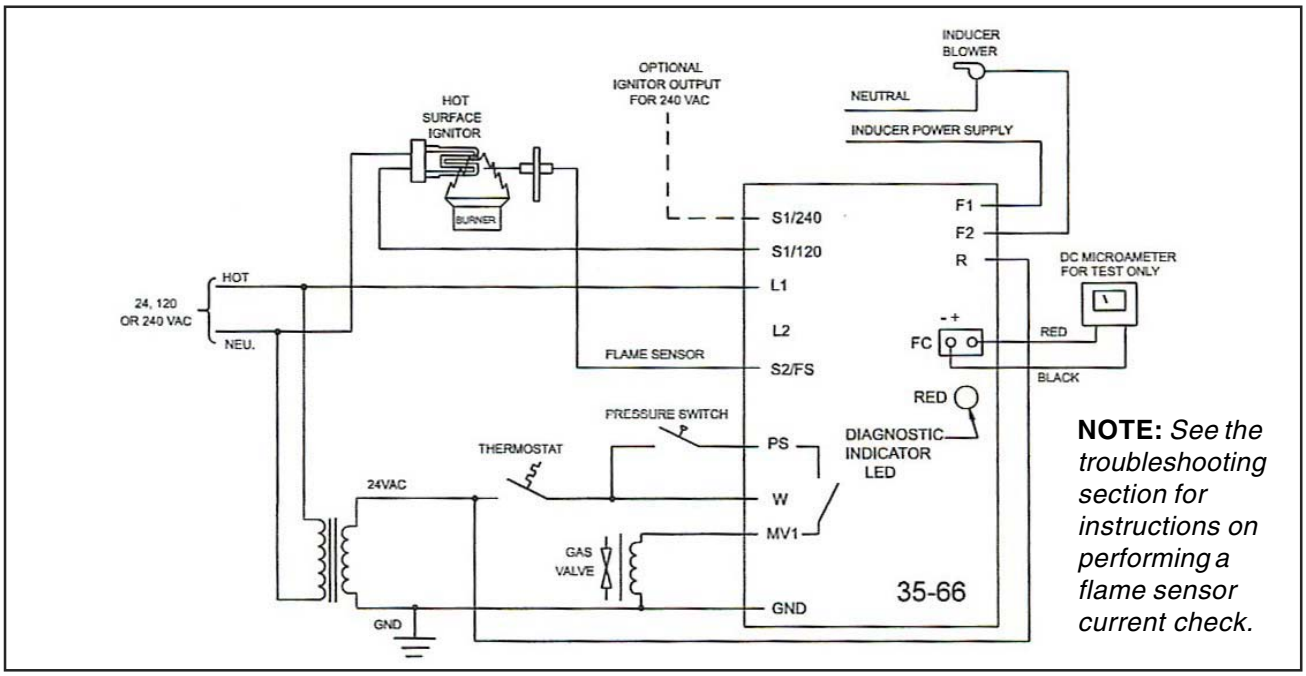


Figure 5: Igniter Controller Diagram

If flame is not detected during the TFI, the main gas valve solenoids close and a 15-second inter-purge delay starts. The control will attempt two additional TFI periods before locking out. In lockout the main gas valve solenoids will be locked out immediately. The controller will reset after one hour if the thermostat is still calling for heat. A new TFI sequence will begin.

NOTE: *If locking out occurs, a manual reset must be performed by resetting the thermostat or removing 24 VAC (turn off the power switch) for a period of 5-seconds.*

The following table lists the igniter terminals and functions.

NOTE: *See the Troubleshooting section for instructions on performing a flame sensor current check.*

Igniter Module Terminal Uses (Figure 5)

S1	Igniter Output – 24 VAC
L1	24 VAC Input
L2	Not Used
S2	Flame Sensor Input
PS	Air Proving Switch
W	Thermostat Input
MV1	Main Gas Valve Solenoids Output
GND	Ground Input
F1	120 VAC Input
F2	120 VAC Fan Drive Output
FC	Not Used
R	24V Hot to Transformer

Fan Operation

The fan switch has two settings: HI and LOW. The fan is mounted inside the oven and must be ON when the oven is in operation. The main burner heats the oven through the burner box. The main burner flames do not come into contact with the air inside the oven. The fan circulates the air inside the oven over the lower surface and maintains a constant, even temperature. The motor control reverses the direction of the fan periodically to provide consistent baking operation.

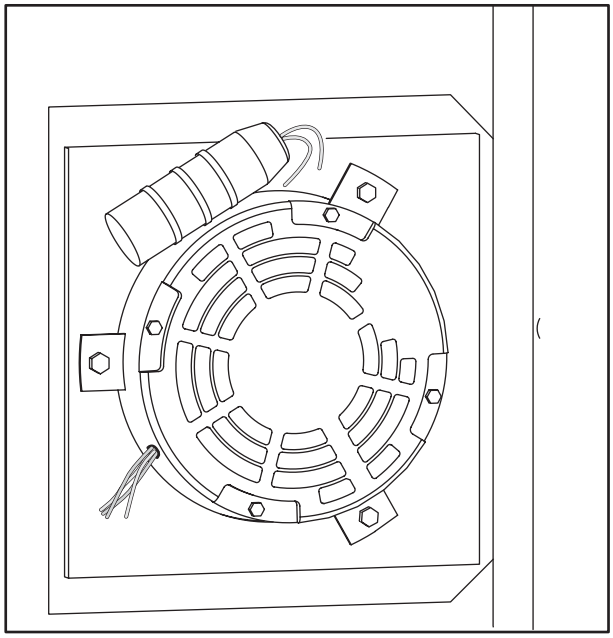


Figure 6: Fan Motor Connections

The fan motor (Figure 6) operates on 120 VAC. Three relays operate on 24 VAC control motor.

The relays function as follows:

- Motor relay 1 (MR1) ON/OFF controls fan rotation by reversing the phase of the motor windings.
- Motor relay 2 (MR2) ON/OFF controls motor operation by routing 120 VAC to the fan motor.
- Motor relay 3 (MR3) ON/OFF controls fan speed by routing 120 VAC to the motor windings.

Door Switch Operation

When the oven door is closed, the door switch (Figure 7) grounds four motor relays: MR2, the ignition control module, the gas solenoid, and the igniter. When the door is open, the ground is removed and the fan motor and gas to the burner shuts off. When the door is open, the ignition control module and igniter cannot operate.

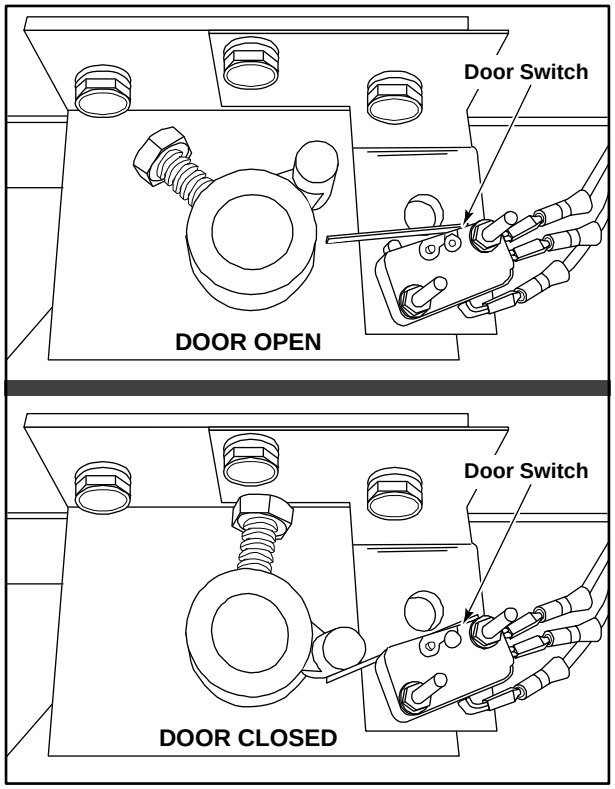


Figure 7: Door Open/Closed

Oven Lights

Light relay (LR1) routes voltage to one side of the four oven lights (Figure 8). The other side of the lights is connected to a neutral. When the controller applies 24 VAC to the light relay, 120 VAC is routed to the oven lights, illuminating the oven cooking area.

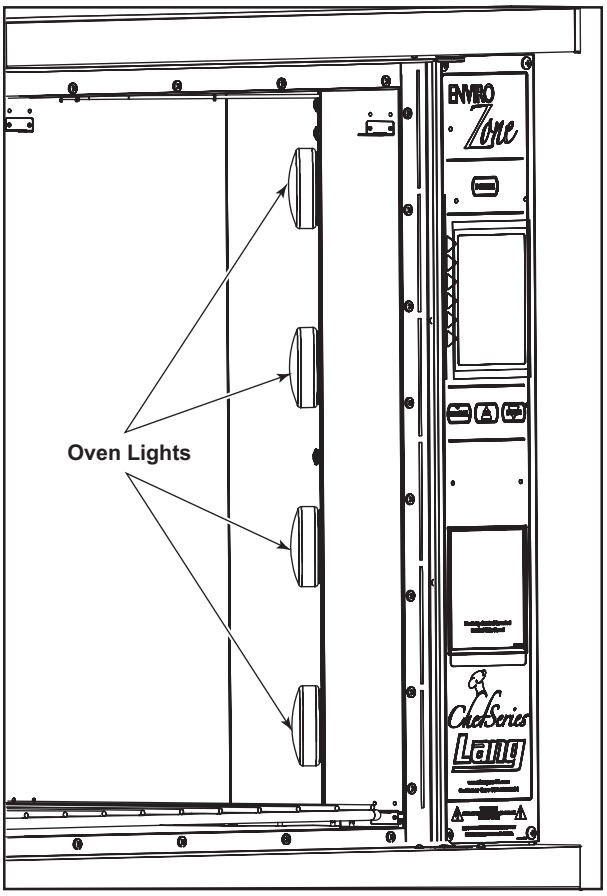


Figure 8: Oven Lights

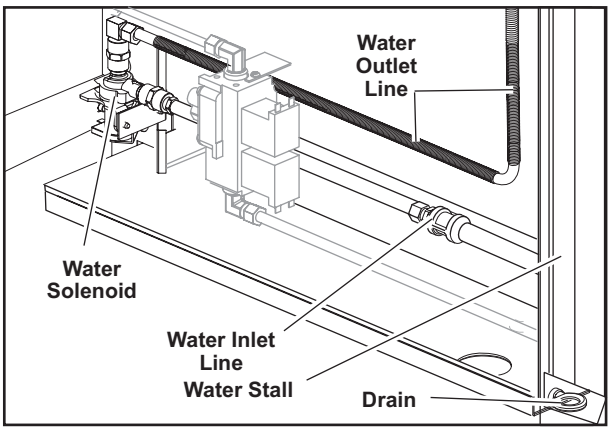


Figure 9: Water Flow Diagram

Water (Steam) Applications

When steam is required for the baking process, the controller activates the water solenoid (SV1) (Figure 9). Water is passed through the water stall (Figure 10) and heated to produce steam. The steam fills the cooking area. The water system has a 3/8″ inlet line and a 3/8″ supply line to the water stall. The water stall drain is 3/4″ allowing excess water to drain quickly from the water stall.

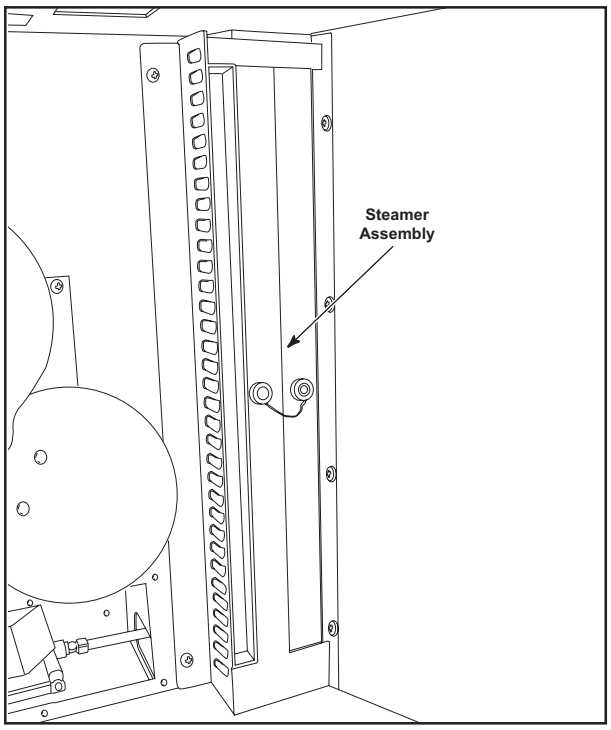


Figure 10: Steamer Assembly (Water Stall)

Burnt Gas Exhaust

When natural gas is burned in the appliance, the burnt gases must be vented away from the appliance. The gases are exhausted out a vent and through a flue (chimney or exhaust vent). There are numerous exhaust/vent systems available to carry the exhaust gases away from the appliance and work area.

WARNING

BURNING NATURAL GAS PRODUCES EXHAUST GASES THAT CONTAIN CARBON MONOXIDE. CARBON MONOXIDE IS A DEADLY GAS THAT KILLS. ENSURE THAT APPLIANCE EXHAUST VENTS, FLUES AND CHIMNEYS ARE INSTALLED AND SERVICED BY PROFESSIONAL INSTALLATION PERSONNEL AND ARE ADEQUATE FOR THE APPLIANCE BEING INSTALLED.

A negative pressure in the appliance allows the exhaust gases to flow up the flue. The flue helps generate air flow around the burner, allowing the burner to burn the gas more efficiently. A draft inducer (Figure 11) provides air to the burner and helps exhaust the burnt gasses.

Draft Inducer Operation

The Draft Inducer is a device mounted on the top of the oven over the exhaust vent. It provides secondary air to the burners by creating a draft. The operation of the Draft Inducer is controlled by the Ignition Control.

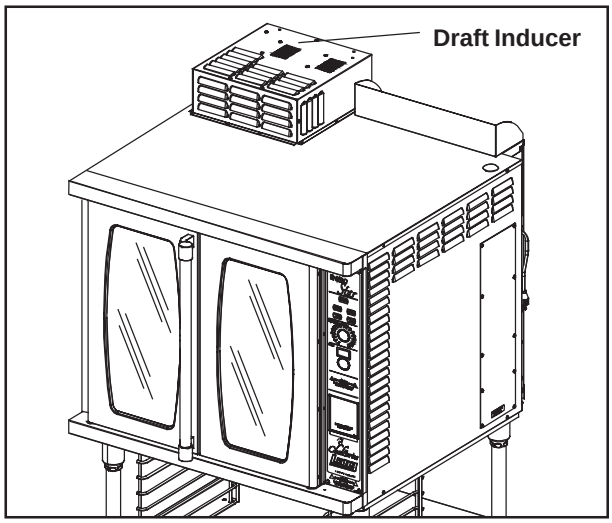


Figure 11: Draft Inducer

NOTE: *See the wiring diagram for wire routing for the draft inducer.*

The draft inducer uses a proving switch to ensure proper air flow when the burner is in operation. The switch is mounted between the controller W terminal and the PS terminal. An internal controller switch (Figure 12) between the PS and MV1 terminals, routes voltage to the main gas valve. If the internal switch is open, the main gas valve solenoid will not open to allow gas flow to the burner.

NOTE: *In a description of the draft inducer, the pressure switch is often referred to as a proving switch. The terms mean the same thing and both refer to the switch monitoring the draft inducer air flow.*

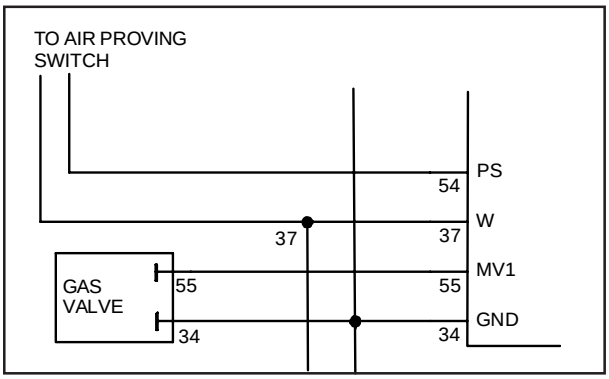


Figure 12: Igniter Controller Internal Switch

During oven operation, combustion air flow is monitored by the proving switch (pressure switch). If the switch contacts remain closed for 30-seconds during ignition sequence without an output signal to the draft fan an airflow fault will be generated. If the pressure switch (proving switch) contacts open during a call for heat operation, the controller (Figure 12) will begin a pre-purge period and a trail for ignition sequence.

If the pressure switch (proving switch) contacts remain open for 30-seconds after draft inducer fan output (F1 and F2) begins, an airflow fault will be signaled and the fan will remain ON. If the pressure contacts open later during a call for heat, the controller will begin a pre-purge period and the trail for ignition sequence.

If the airflow signal (PS) is lost while the burner is firing, the controller will immediately de-energize the main gas valve solenoid and an airflow fault will be displayed. The controller will continue to monitor the proving switch (pressure switch) input waiting for airflow to return. When airflow is detected, a trail for ignition sequence will begin, followed by a pre-purge period. If airflow does not return, the controller will enter a lockout condition and the draft inducer fan will shut OFF.

During normal sequence, if a flame signal occurs due to the main gas valve solenoid not closing all the way, the controller will energize the draft inducer fan. If the gas valve solenoid closes, the controller will shut off the draft inducer fan.

CONTROLS

The electronic control panel (Figure 13) is used to control oven operation. The unit also has manual backup controls.

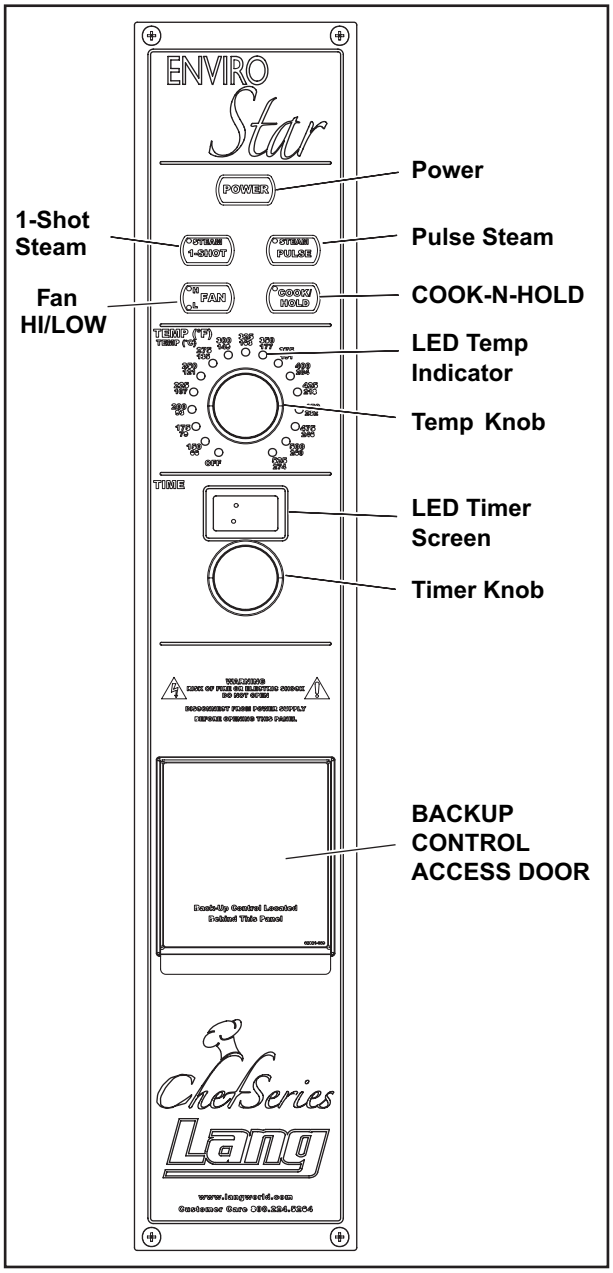


Figure 13: Electronic Control Panel

Electronic Control Panel (Figure 13)

POWER:

- ON/OFF button
- When pressed ON, interior lights and panel indicators turn on
- When pressed OFF, interior lights and panel indicators turn off and the fan remains ON until the oven cools down to 250° F

FAN:

- ON/OFF Switch
- Has two operating speeds: L=LOW & H=HI
- Must be turned on during operation
- During operation, the fan will reverse directions periodically to maintain consistent condition

LED TEMPERATURE INDICATOR:

- Displays oven temperature
- ON indicates oven at set point
- Blinks with a call for heat or cooling to temperature

TEMPERATURE KNOB:

- Used to set oven temperature
- Dial to desired temperature

TIMER SCREEN:

- LED digital display
- Displays time remaining in cooking cycle
- Displays time selection for Steam Pulse
- Displays time selection for Steam 1- Shot time

TIMER KNOB:

- Sets cooking time
- Sets Steam Pulse time
- Sets Steam 1-Shot time

COOK/HOLD:

- Activated when cooking cycle stops and a beeper will sound 5 times
- Beeper will sound 5 times
- COOK/HOLD light will turn OFF
- Oven temperature will drop to 150° F
- Temperature will remain at 150° F until operator chooses a new cooking cycle or turns the oven OFF

1-SHOT STEAM:

- Provides a 1 – 20 second single–shot of steam to the cooking chamber
- Adjust by holding down the button while turning the TIMER KNOB until the desired time is displayed on the LED TIMER SCREEN (Figure 13)

PULSE STEAM:

- Sends a 1-second shot of steam to the cooking chamber
- Adjust time from 1 – 120 seconds by holding down the button and turning the TIMER KNOB until the desired time is displayed on the LED TIMER SCREEN

Using Backup Controls

The EnviroSTAR oven is designed with a set of backup controls that can be used manually instead of using the electronic oven controls. These controls (Figure 14) are mounted behind a door below the oven control panel (Figure 13). Controls include the BACKUP/MANUAL switch, a TEMPERATURE knob and a STEAM switch.

The BACKUP/MANUAL switch overrides the electronic controls and activates the backup controls. The TEMPERATURE knob controls the temperature. The STEAM toggle switch controls the steam. In this mode, the fan will operate at HI speed only.

The Backup mode does not use the energy-saving option and does not allow the fan to operate at Low speed or reverse direction.

To use the backup controls, place the BACKUP/ MANUAL switch in the BACKUP position.

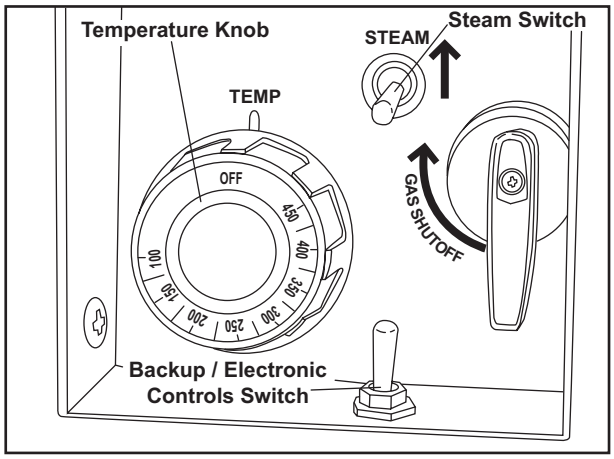


Figure 14: Backup Controls

Initial Power ON Test

Follow these steps to verify the operation and temperature control of the oven:

- Press the POWER button ON and verify that the interior and panel lights turn on.
- Set the temperature to 300°F and verify that the TEMP INDICATOR light is blinking.
- Verify that the oven reaches the set point and signals Ready with an audible tone within 12 minutes (starting with a cold oven).
- Set the timer to 10 minutes and verify that the fan stops and reverses direction after approximately 108 seconds. (A full reversing cycle takes 120 seconds.)

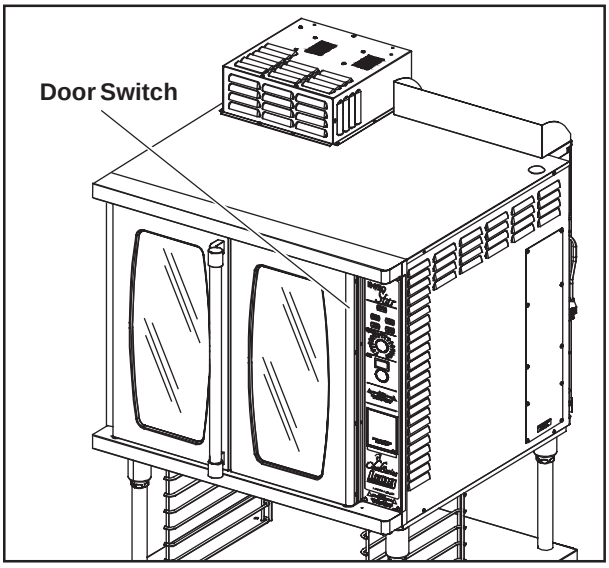


Figure 15: Door Switch Location

- Open the oven door (Figure 15) and verify that the fan and TIMER stop then restart when the door is closed.
- Turn both the TIMER KNOB and TEMP KNOB to zero.
- Confirm that the fan stays on until the temperature drops below 250°F.

Water/Steam Test

Follow these steps to verify the water and steam operation of the oven:

1. Identify the water purification system used.
2. Flush the water system to remove tainted water from the system.
3. Put the oven into Backup mode and set the temperature to 400°F.

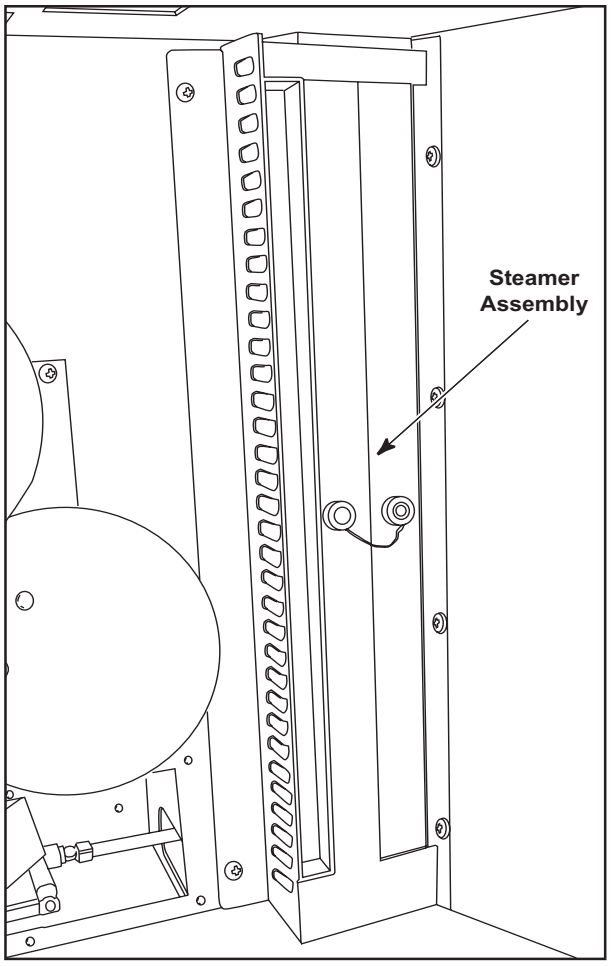


Figure 16: Water/Steam System (Water Stall)

4. Once up to temperature, use the STEAM SWITCH on the control panel (Figure 17) to flush water through the steam system (water stall) (Figure 16) for one minute.
5. Check the water drain for proper operation.

Operating Sequence

NOTE: *Refer to the Lang™ GCSF-ES/GCSF-EZ Installation and Operation Instructions for full operational description, including optional features.*

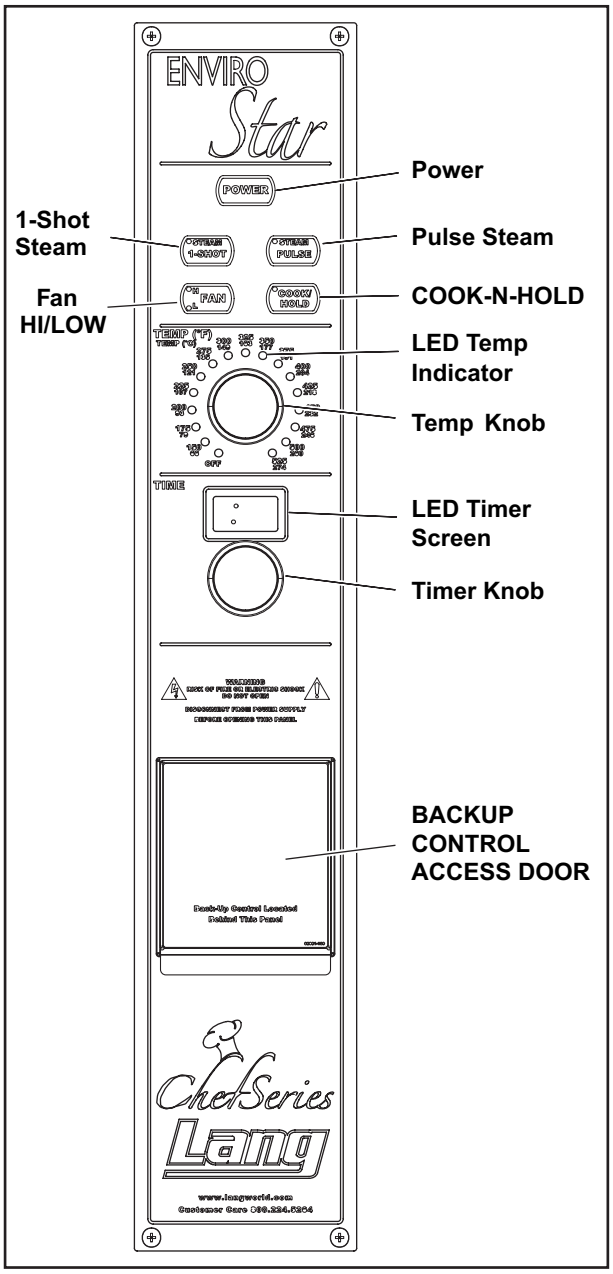


Figure 17: Electronic Control Panel

The following table lists typical operating sequences in order and results.

Operating Sequence

ACTION	RESULT
Power button pressed ON	Panel lights and interior lights illuminate.
HI or LOW fan speed selected	HI or LOW fan speed light illuminates.
TEMP KNOB used to select 125° F – 525° F **NOTE:** The minimum temperature for steam operation is 125° F.	Oven begins heating and fan begins air circulation. **NOTE:** The fan will reverse direction every two minutes during the cooking process.
STEAM PULSE button pressed while selecting a steam pulse time from 1 – 120 seconds	STEAM PULSE light illuminates, TIMER LED momentarily displays pulse time and steam pulse is applied.
Set temperature reached within 12 minutes	Buzzer sounds eight times.
Product loaded into oven	Product begins to bake.
TIMER used to set cooking time	Cook time displays on LED and countdown begins. **NOTE:** If the steam pulse is used, a one-second shot of steam is applied to the baking area.
Optional COOK/HOLD button pressed	COOK/HOLD light illuminates.
Set cooking time expires	Five-beep tone sounds. **NOTE:** If COOK/HOLD is used, the oven temperature will drop to 150° F, the COOK/HOLD light will turn OFF and the oven will maintain at 150° F until the oven is turned OFF or a new cooking cycle is started.
Product removed from oven	Oven is ready for cooking.

MAINTENANCE

CAUTION

Always keep clear of combustible materials.

CAUTION

Keep the floor in front of equipment clean and dry. If spills occur, clean immediately to avoid the danger of slips or falls.

- Water filters and conditioners should be inspected and replaced per manufacturer's recommendations.

OVEN CLEANING

Exterior

See STAINLESS STEEL CARE AND CLEANING.

Interior

WARNING

KEEP WATER AND SOLUTIONS OUT OF THE CONTROLS AREA. NEVER SPRAY OR HOSE THE CONTROL PANEL.

CAUTION

Most cleaners are harmful to the skin, eyes, mucous membranes and clothing. Precautions should be taken to wear rubber gloves, goggles or a face shield and protective clothing.

CAUTION

Carefully read all warnings and follow the directions on the label of the cleaner to be used.

CAUTION

Never leave a chlorine sanitizer in contact with stainless steel surfaces longer than ten minutes. Prolonged contact can cause corrosion.

CAUTION

Do not use caustic cleaners.

- Always start with a cold oven.
- Always follow the oven cleaner instructions.
- Do not use caustic cleaners. Using any harsh chemicals will result in removal of the ETC coating and etching of the porcelain.
- The oven interior should be cleaned using mild soap and a non-metal scouring pad.
- Care should be taken to prevent caustic cleaning compounds from coming in contact with the fan wheel.
- Oven interior should be wiped down daily and thoroughly cleaned weekly using warm water and mild detergent. Do not use caustic cleaners.
- This appliance should be checked at six-month intervals by a qualified technician (heating unit, mechanical stability, corrosion, etc.), especially control and safety devices.
- The oven racks and rack slides may be removed and cleaned outside the oven using oven cleaner.
- The stainless exterior can easily be cleaned using stainless steel cleaner.
- Always apply stainless steel cleaners when the oven is cold and rub in the direction of the metal's grain.

STAINLESS STEEL CARE

Cleaning

Stainless steel contains 70-80% iron, which will rust if not properly maintained. It also contains 12-30% chromium, which forms an invisible passive, protective film that shields against corrosion. If the film remains intact, the stainless steel will remain intact. However, if the film is damaged, the stainless steel can break down and rust. To prevent stainless steel breakdown, follow these steps:

CAUTION

Never use any metal tools. Scrapers, files, wire brushes or scouring pads (except for stainless steel scouring pads) will mar the surface!

CAUTION

Never use steel wool, which will leave behind particles that rust!

CAUTION

Never use acid-based or chloride-containing cleaning solutions, which will break down the protective film!

CAUTION

Never rub in a circular motion!

CAUTION

Never leave any food products or salt on the surface. Many foods are acidic. Salt contains chloride!

For routine cleaning, use warm water, mild soap or detergent and a sponge or soft cloth.

For heavy-duty cleaning, use warm water, a degreaser and a plastic, stainless steel or Scotch-Brite pad.

Always rinse thoroughly. Always rub gently in the direction of the steel grain.

Preserving & Restoring

Special stainless steel polishing cleaners can preserve and restore the protective film.

Preserve the life of stainless steel with a regular application of a high quality stainless steel polishing cleaner as a final step to daily cleaning.

If signs of breakdown appear, restore the stainless steel surface. First, thoroughly clean, rinse and dry the surface. Then, on a daily basis, apply a high-quality stainless steel polish according to manufacturer's instructions.

Heat Tint

Darkened areas, called heat tint, may appear on stainless steel exposed to excessive heat, which causes the protective film to thicken. It is unsightly but is not a sign of permanent damage.

To remove heat tint, follow the routine cleaning procedure. Stubborn heat tint will require heavy-duty cleaning.

To reduce heat tint, limit the exposure of equipment to excessive heat.

LOCKOUT/TAGOUT PROCEDURES

This section of the manual describes removal and replacement of the various parts available from an authorized service provider. For part numbers, refer to the exploded view parts list in the Operations Manual provided with the unit.

Electrical Lockout/Tagout

The Lockout/Tagout procedure is used to protect personnel working on an electrical appliance. Perform the following steps when performing any type of maintenance or service on an electrically operated appliance.

1. In electrical box, place unit's circuit breaker into OFF position.
2. Place a lock or other device on electrical box cover to prevent someone from placing circuit breaker ON.
3. Place a tag on electrical box cover to indicate that unit has been disconnected for service and power should not be restored until tag is removed by maintenance personnel.
4. Disconnect unit power cord from electrical outlet.
5. Place a tag on cord to indicate that oven has been disconnected for service and power should not be restored until tag is removed by maintenance personnel.

Gas Lockout/Tagout

The Gas Lockout/Tagout procedure is used to protect personnel working on a gas appliance. Before performing any type of maintenance or service on a gas appliance, follow these steps:

1. Locate the natural gas or inlet valve and place the valve in the OFF position.
2. Place a tag on the valve indicating that service is being performed on equipment and the natural gas must remain off until service is complete by the maintenance personnel.
3. Place a locking device on the natural gas inlet valve preventing actuation until the lock is removed by the maintenance personnel.
4. On the appliance, make sure all flame sources are extinguished and/or removed by maintenance personnel.
5. Bleed residual gas from the appliance inlet line and allow time for the gas to dissipate before beginning service on the appliance.

Gas Leak Test

After completing service on any natural gas appliance, all gas joints disturbed during service must be check for leaks. DO NOT USE AN OPEN FLAME. Use a hazardous gas tester or a soap and water solution.

1. Apply a soap and water solution to gas joint and check for bubbles.
2. If bubbles are present, the joint is leaking and must be repaired before using the appliance.

Electronics Access

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual..

CAUTION

In the following steps, the upper and lower edges of the electronics drawer slide in and out of the mounting brackets. DO NOT pull the drawer completely out from the oven, as it could slip out and damage wiring and/or other components. If further access to the drawer area is needed, perform the External Right Side Panel Removal procedure.

2. Open the oven doors approximately eight to ten inches.

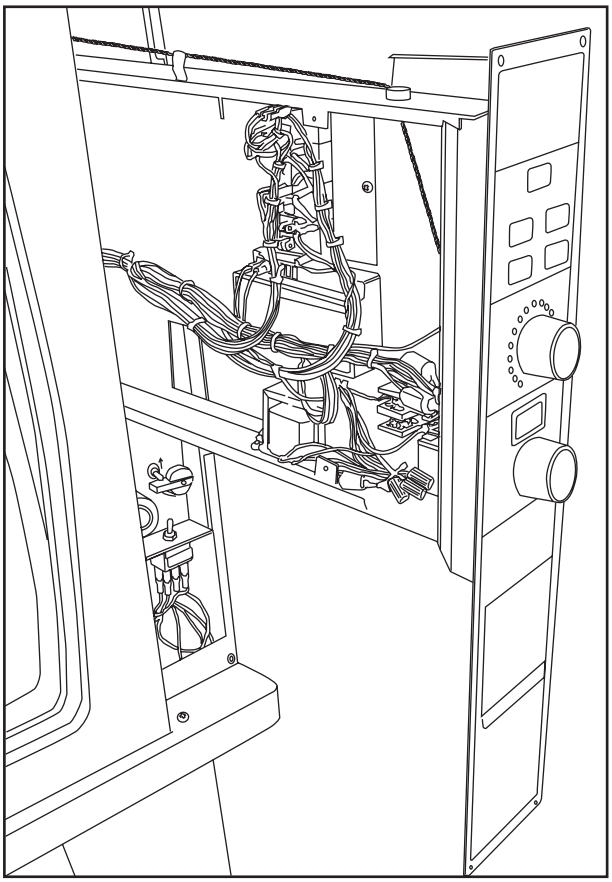


Figure 18: Electronics Drawer

3. Remove four screws located at the top and bottom of the front panel.
4. Carefully slide the electronics drawer (Figure 18) out from the oven.

Main Power Fuse Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Locate the fuse block (Figure 19) in the electronics drawer (Figure 20).

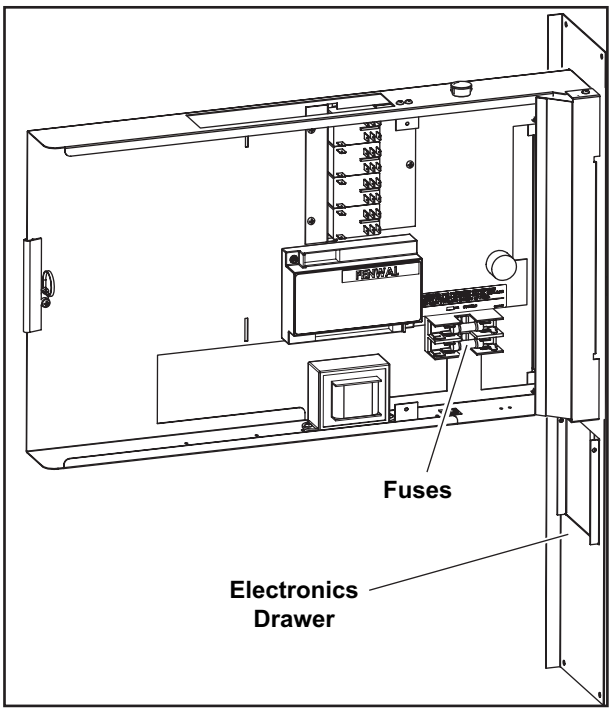


Figure 19: Fuse Locator

4. Use an Ohmmeter to ensure the fuse is open before replacing it. An ohm reading indicates the fuse has continuity and is good.
5. Using a fuse puller or similar tool remove the fuse.
6. Install an exact replacement fuse (Figure 21) in the fuse holder. (Class G, Type SC-15, Time Delay, rated for 600 VAC)
7. Slide the electronics drawer closed, but do not install mounting screws.
8. Connect the oven to external power, and press the front panel POWER button to ensure the oven is operational.
9. When proper operation is determined, install and tighten four mounting screws.

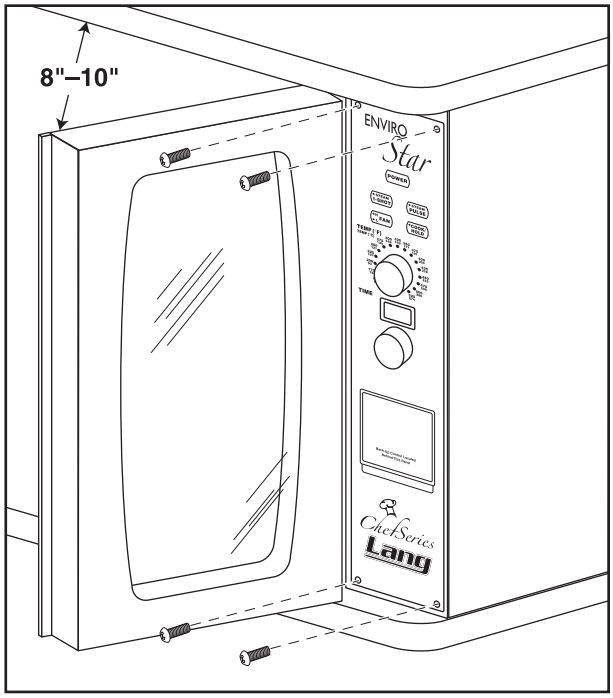


Figure 20: Electronics Drawer Access

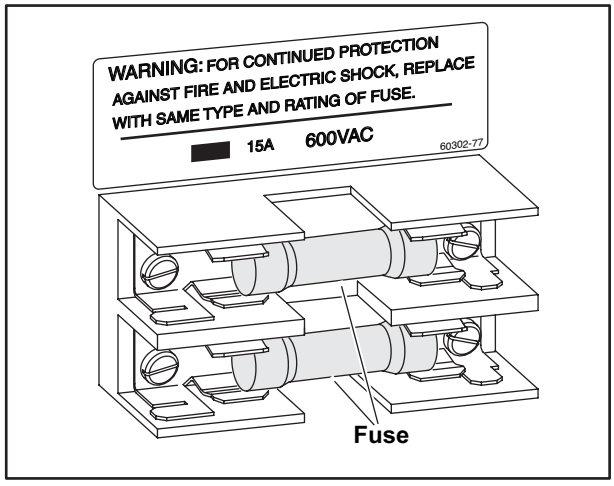

WARNING: FOR CONTINUED PROTECTION AGAINST FIRE AND ELECTRIC SHOCK, REPLACE WITH SAME TYPE AND RATING OF FUSE.
15A 600VAC
60302-77
Fuse

Figure 21: Fuse Replacement

Circuit Board Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Remove the heat shield on the right side front (Figure 22) of the electronics drawer by removing mounting screws at the top and bottom.

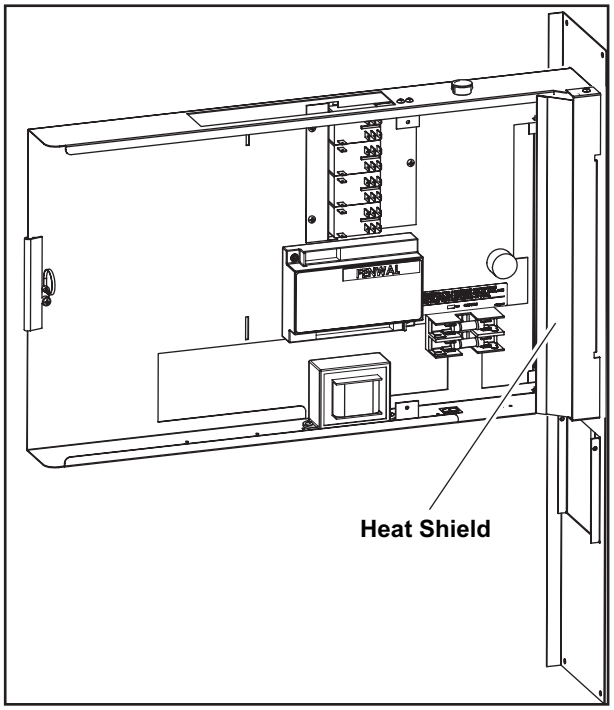


Figure 22: Heat Shield

4. Tag and disconnect five cables (Figures 23 and 24) from the circuit board. DO NOT pull on the wires!
5. Carefully pull off the knobs from the temperature selector and timer.
6. Remove the mounting nut and washer from temperature selector and timer shafts.
7. Remove the nuts and nylon washers from in the four corners of the circuit board.
8. Carefully remove the circuit board from the threaded studs.

NOTE: *A spacer and two washers remain on each mounting stud. Do not lose the washers and spacers.*

9. To install a replacement circuit board, carefully insert the temperature selector and timer shafts through the front panel and position the circuit board on the four corner studs.
10. Secure the circuit board with nylon washers and nuts but do not tighten nuts.
11. Secure the temperature selector and timer with a washer and nut and tighten nut securely.
12. Install knobs on the temperature selector and timer.
13. Tighten the circuit board nuts securely.
14. Using tags created during removal, connect five cables to the circuit board.
15. Slide the electronics drawer closed but do not install mounting screws.
16. Connect the oven to external power, and press the panel POWER button ON to ensure the oven is operational.
17. Secure the electronics drawer with four screws and tighten screws securely.
18. Place the heat shield in position, secure with two screws and tighten screws securely.

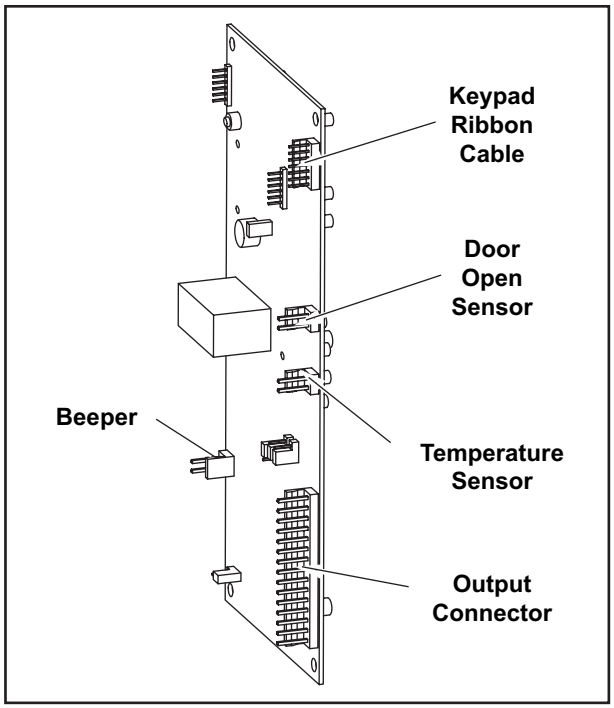


Figure 23: Circuit Board Connectors

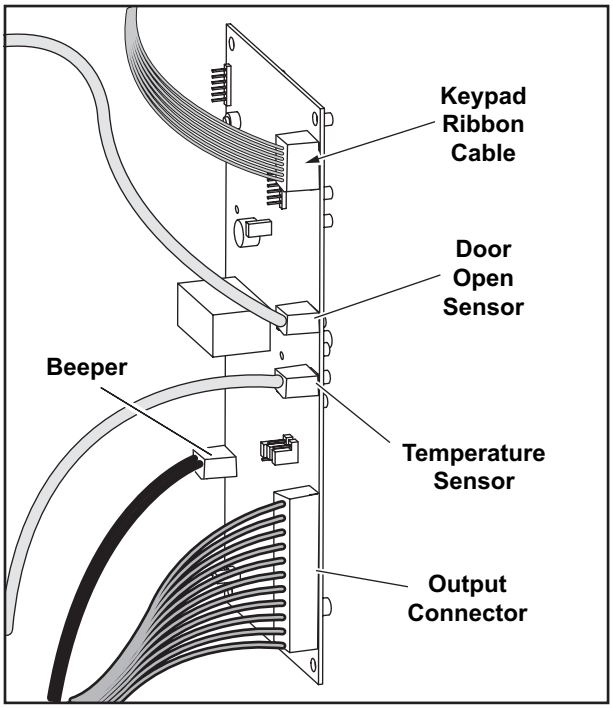


Figure 24: Circuit Board Cables

Power Transformer Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Remove two mounting screws from the wire cover (Figure 25), pivot cover to the left and remove.
4. Cut the ties securing transformer wires.
5. Remove two screws securing transformer (Figure 26) to the drawer base.
6. Tag and disconnect transformer wires.
7. Position replacement transformer and secure with two mounting screws.
8. Using tags created during removal, connect wires to the replacement transformer.
9. Secure the wiring with plastic ties.
10. Slide the electronics drawer closed but do not install mounting screws.
11. Connect the oven to external power, and press the POWER button ON to ensure the oven is operational.
12. Secure electronics drawer with four screws and tighten screws securely.

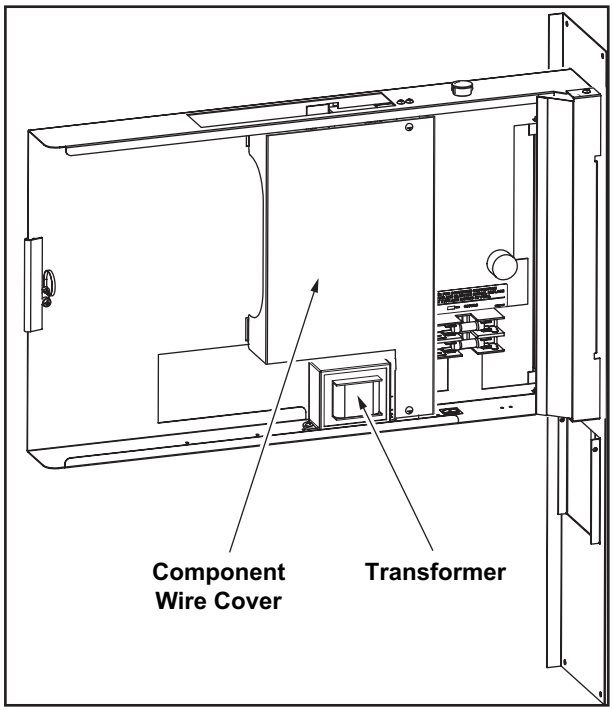


Figure 25: Component Wire Cover Location

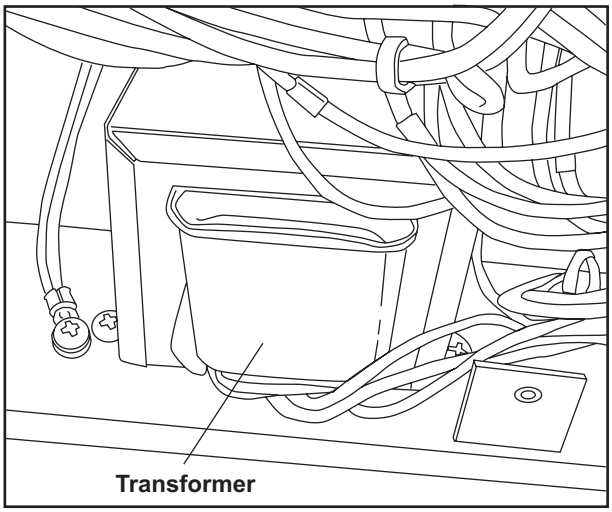


Figure 26: Transformer

Beeper Removal

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Remove the beeper connector from the circuit board (Figure 27).

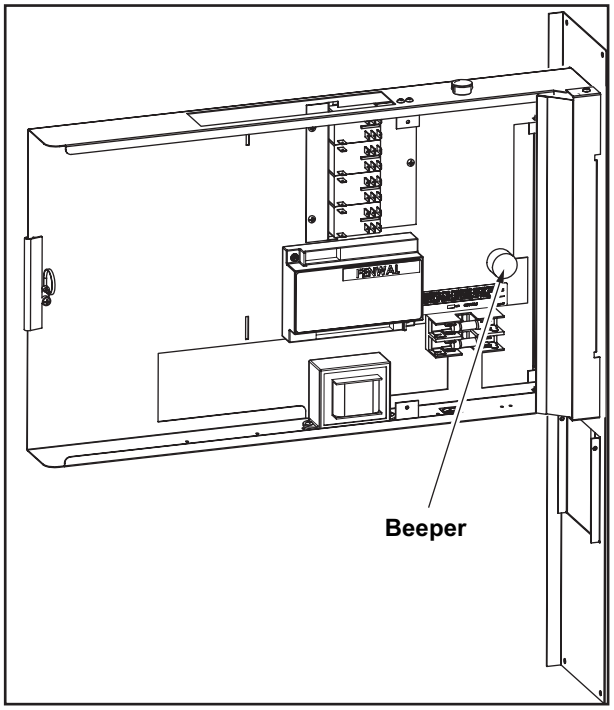


Figure 27: Beeper Location

4. While holding the beeper, remove the mounting ring from the side of the drawer housing.
5. Install the new beeper and connect the cable connector into the circuit board.
6. Slide the electronics drawer closed but do not install mounting screws.
7. Connect the oven to external power and press the POWER button ON to ensure the oven is operational.
8. Secure electronics drawer with four screws and tighten securely.

Relays

Four 24 VAC relays are used to operate the relay coil, which acts like a switch. The relays control the circuits as follows:

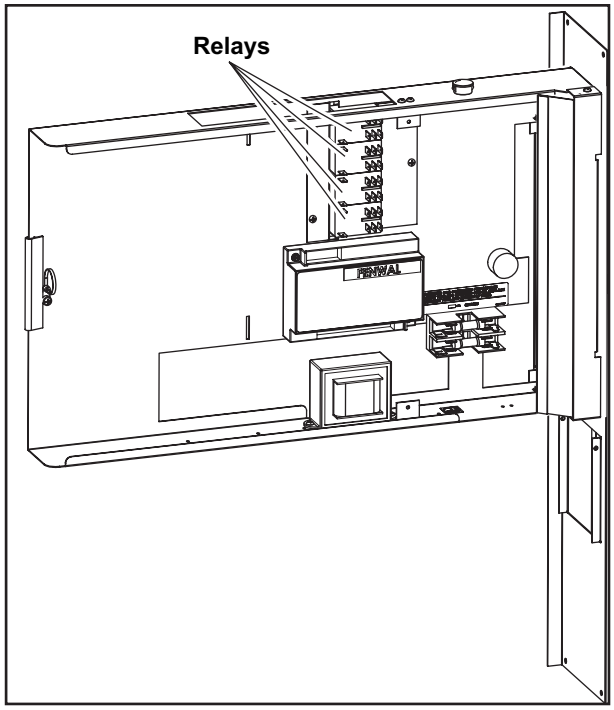


Figure 28: Relay Mounting

- Relay 1 – MR1 – Fan Motor Forward/Reverse
- Relay 2 – MR2 – Fan Motor Run
- Relay 3 – MR3 – Fan Motor HI/LOW Speed
- Relay 4 – LR1 – Light

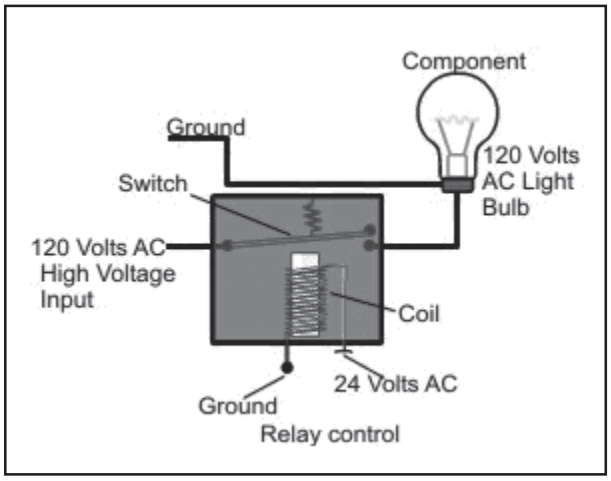


Figure 29: Basic Relay Operation

Relay Operation

Relays use low voltage (Figure 29) to activate a switch that routes a higher voltage to a component.

All four oven relays operate in the same manner. One side of the coil (Figure 29) is grounded. When activated by the control system (circuit board), 24 VAC is routed to the other side of the coil. With ground and 24 VAC applied to the coil, a magnetic field is generated. The magnetic field pulls the switch down. The 120 VAC is then routed through the switch to one side of the light bulb. Because the other side of the light bulb is grounded, the bulb illuminates.

Relay Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.

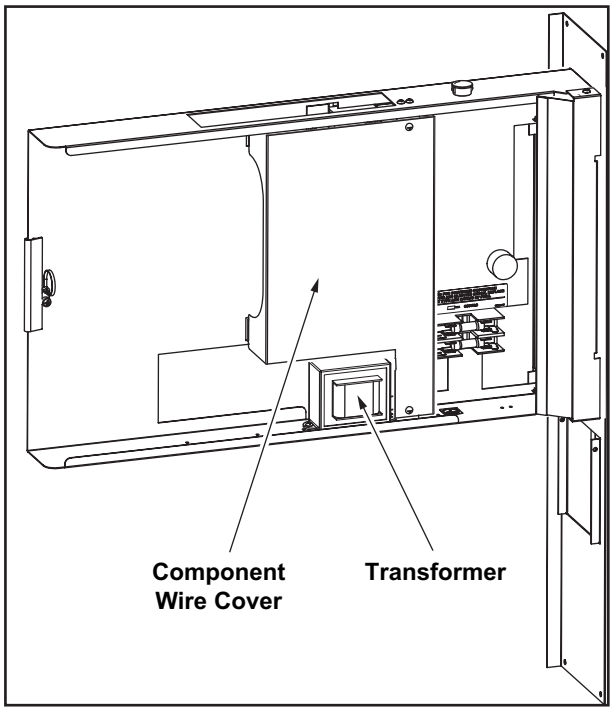


Figure 30: Wire Cover

3. Remove two mounting screws from the wire cover (Figure 30), pivot the cover to the left and remove.
4. Locate the relay (Figure 31) and remove the screw and relay clamp on the right side.
5. Tag and disconnect wires from the relay.
6. Using tags created during removal, connect wires to the relay.
7. Position the relay for installation.
8. Secure the relay with the clamp and screw.
9. Slide the electronics drawer closed but do not install the mounting screws.
10. Connect the oven to external power, and press the POWER button ON to ensure the oven is operational.
11. Secure the electronics drawer with four screws.

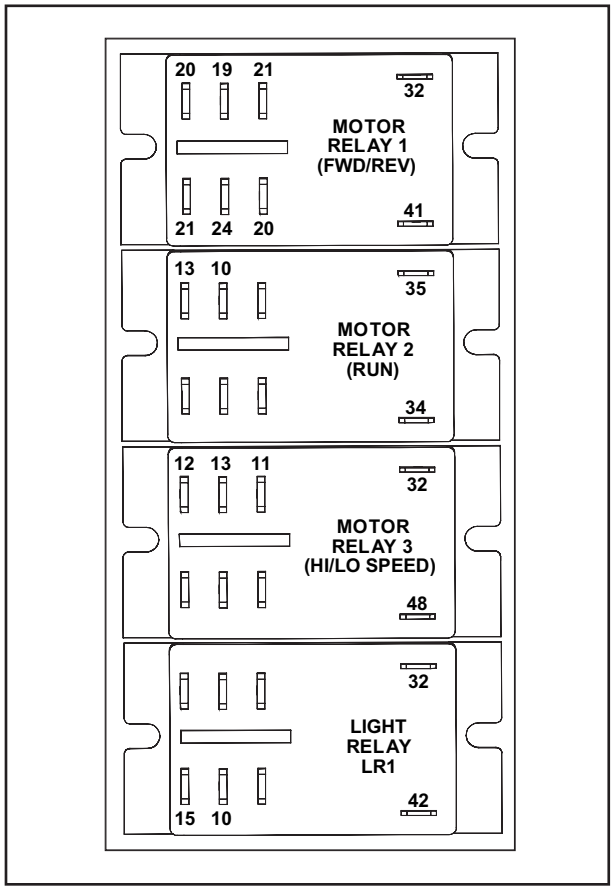


Figure 31: Relay Connections

Ignition Controller Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Remove two mounting screws from the wire cover (Figure 30), pivot the cover to the left and remove.
4. Locate the ignition controller (Figure 32) in the electronics drawer.
5. Remove mounting screws from the upper left and lower right corners.
6. Tag and disconnect wires from the ignition controller.
7. Position the new ignition controller and secure with two screws.

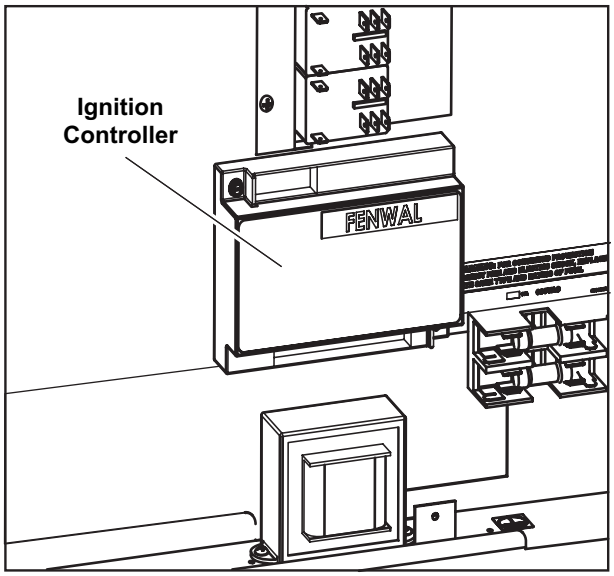


Figure 32: Ignition Controller

8. Using tags created during removal, connect wires to the replacement controller.
9. Slide the electronics drawer closed, but do not install mounting screws.
10. Connect the oven to external power, and press the POWER button ON to ensure the oven is operational.
11. Secure the electronics drawer with four screws.

Right Side Panel Removal

The gas valves, water valves and connections are mounted behind the right side panel.

CAUTION

Sheet metal edges can cut! Avoid bare hand contact with metal edges. Wear protective gloves during installation, operation, cleaning, and maintenance.

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Remove four screws from the right side panel (Figure 33) at rear of the oven.

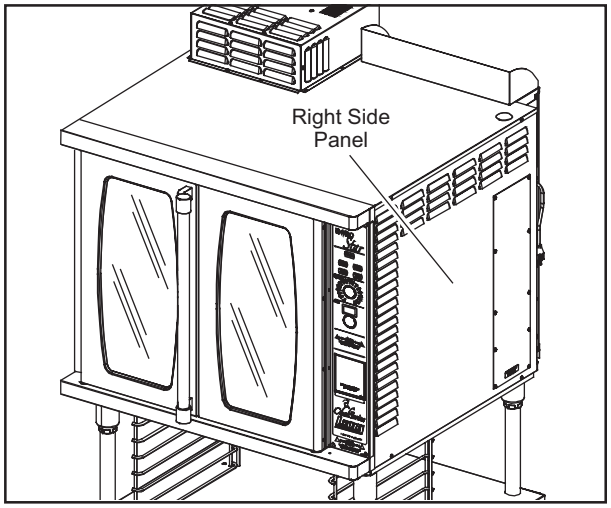


Figure 33: Right Side Panel

3. Remove the two screws from lower edge of the right side panel.
4. Remove two screws from the upper edge of the right side panel.

NOTE: *The right side panel has a flange along the top, bottom and rear.*

5. Carefully slide the side panel back about ¾ inch and straight down for removal.
6. To install right side panel, reverse above steps.

Temperature Sensor Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Perform the External Right Side Panel Removal procedure.
4. Disconnect the temperature sensor plug from the circuit board connector (Figure 23) and pull the tube through the grommet in the drawer.

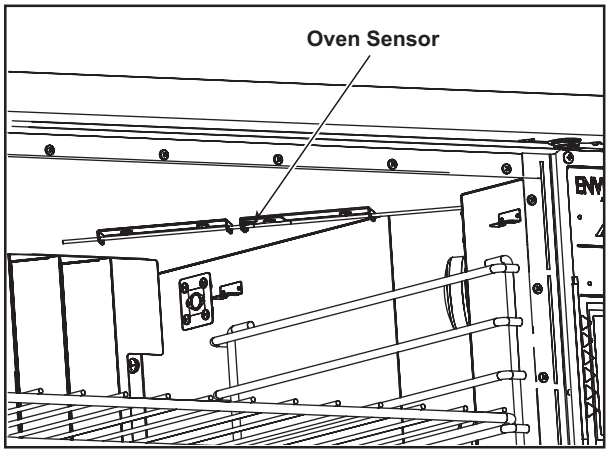


Figure 34: Temperature Sensor Location

5. Grasp the sensor (Figure 34) near the entry into the oven, push it out of the oven and into the electronics drawer.
6. Pull the sensor out of the oven wall and into the electronics drawer.
7. Slide the tip of the new sensor through the oven wall hole into the oven.
8. Slide the tip of the sensor through the holes and into the mounting bracket until it protrudes ¾ inch from the end of the bracket.
9. Pass the temperature sensor tube (Figure 35) through the grommet into the electronics drawer.
10. Attach the connector to the circuit board (Figure 23).
11. To install all previously removed parts, reverse the above steps.

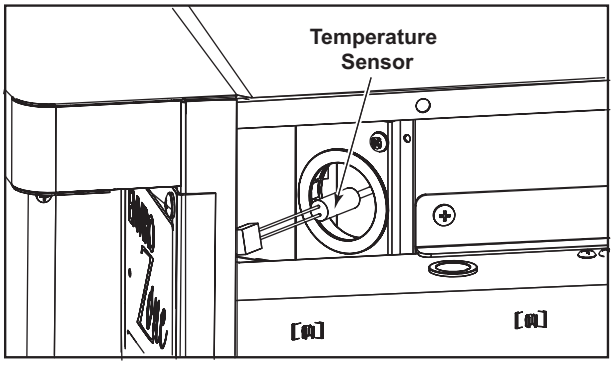


Figure 35: Temperature Sensor

12. Slide the electronics drawer closed but do not install the mounting screws.
13. Connect the oven to external power, and press the POWER button ON to ensure the oven is operational.
14. Secure the electronics drawer with four screws.

Fan Motor Starter Capacitor Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Remove the motor access panel at the rear of the oven.

WARNING

ELECTRICAL HAZARD THE CAPACITOR MAY BE CHARGED.

3. Remove the rubber boot covering the connectors on the motor starting capacitor (Figure 36).
4. Discharge the capacitor.
5. Tag and disconnect wires from the capacitor.
6. Remove three screws securing the capacitor mounting straps to the rear housing.
7. Remove mounting straps from the capacitor and install onto the new capacitor.
8. Position the new capacitor for installation.
9. Secure the capacitor with three screws in the mounting straps.

10. Using tags created during removal, connect wires to the new capacitor.
11. Position the motor access panel at the rear of the oven.
12. Connect the oven to external power and press the POWER button ON to ensure the oven is operational.

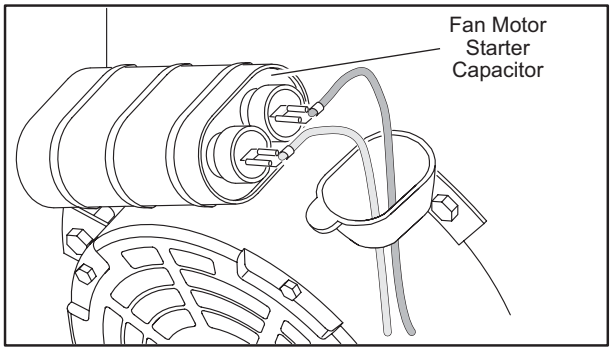


Figure 36: Fan Motor Starter Capacitor

Internal Access

1. Remove the cooking racks from the oven.
2. Remove the rack guides from the left and right oven walls.
3. Grasp the left edge of the intake cover (Figure 37) and pull the cover forward while pressing back the spring clip on the left side of the fan shroud.
4. Slide the intake cover slightly forward and to the left for removal.
5. Pivot the lower edge of the intake cover forward and the upper edge back to carefully remove it from the oven.

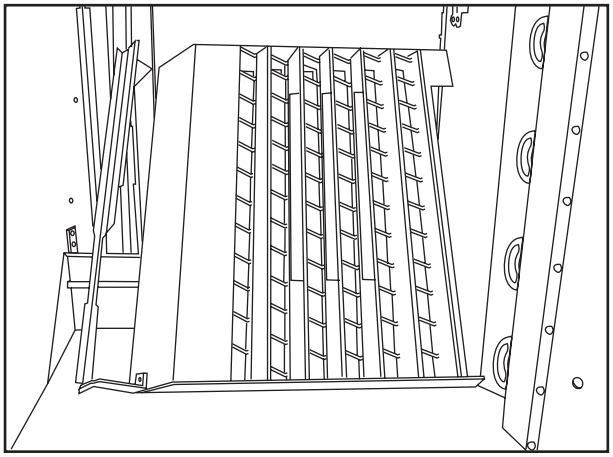


Figure 37: Intake Cover Removal

6. Remove four thumb screws (Figure 38) from the corners of the fan shroud.
7. Pivot the bottom of the fan shroud forward and the upper edge back to carefully remove it from the oven.

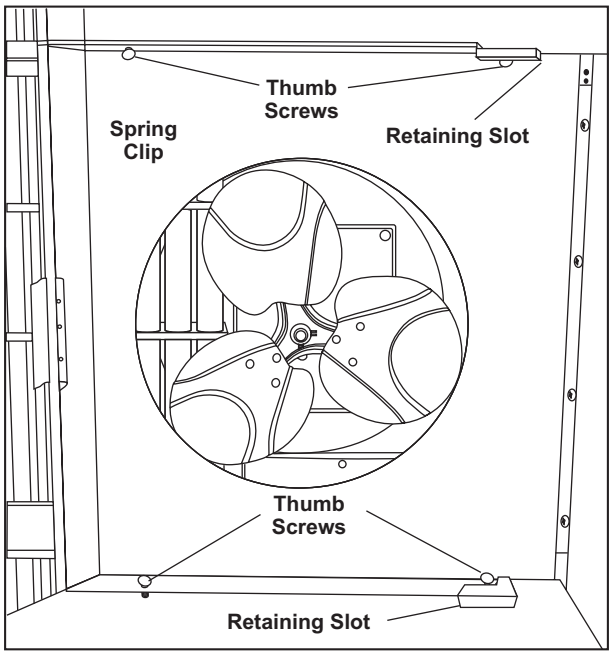


Figure 38: Fan Shroud

Fan Blade Removal

1. Perform the Internal Access procedure.
2. Measure and note the distance from the end of the motor shaft (Figure 39) to the outer edge of the fan blade mounting clamp (typically 1 inch).

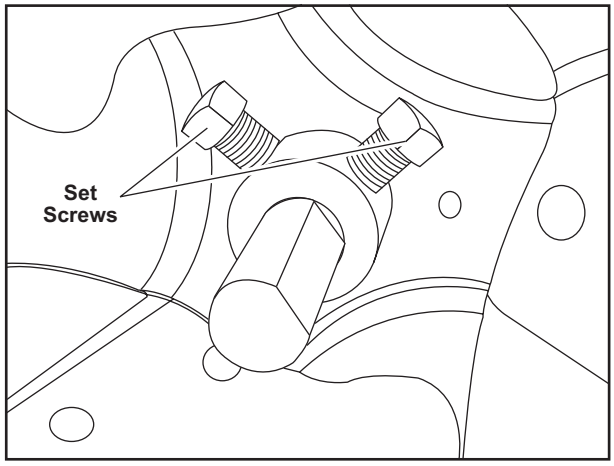


Figure 39: Fan Blade Removal

3. Loosen the two set screws securing the fan blade to the motor shaft.
4. Slide the fan blade (Figure 40) assembly off the motor shaft. A puller may be necessary to remove fan blade.

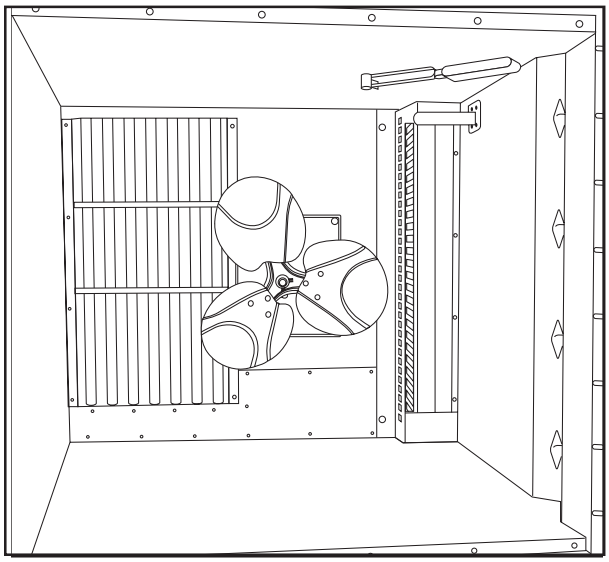


Figure 40: Fan Assembly

Fan Motor Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Fan Blade Removal procedure.
3. At the rear of the oven, remove the motor access panel.
4. Discharge the capacitor.
5. Remove the rubber boot (Figure 38) covering the connectors on the motor starter capacitor.
6. Tag and disconnect wires from the capacitor.
7. Loosen the three motor-mounting bolts and remove the upper and lower right bolts and split-ring lock washers.
8. While supporting the motor (Figure 41), remove the third bolt and washer.
9. Carefully remove the motor from the oven.
10. If the new motor does not have a small fan blade mounted on the shaft, perform the Motor Small Fan Blade Installation procedure.

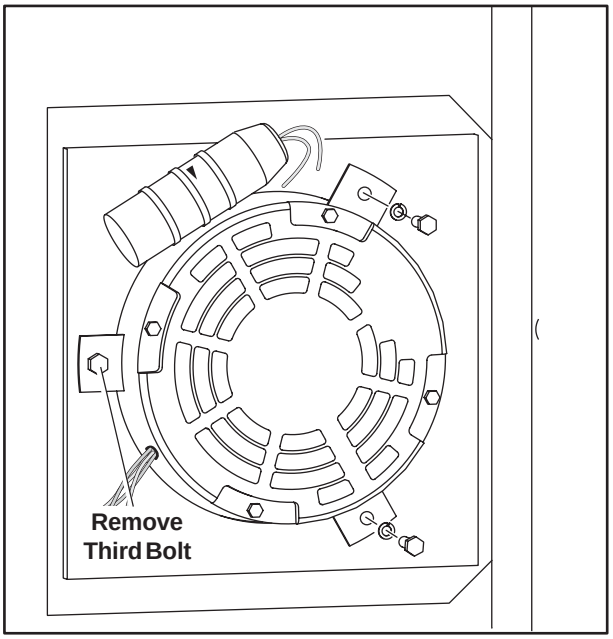


Figure 41: Fan Motor

11. Tag and disconnect wires from the motor.
12. Using tags created during removal, connect wires to the replacement motor.
13. Insert the motor shaft and the small fan blade through the rear housing.
14. Position the motor with the wires on the lower left and secure the motor with three mounting bolts and tighten bolts evenly and securely.
15. Inside the oven, position the motor shaft with the flat surface facing up.
16. Position the fan blade with the clamp facing away from the motor.
17. Position the fan blade assembly with one set screw pointing up and the second pointing to the left.
18. Slide the fan blade onto the motor shaft.
19. Using the measurement taken during removal, position the fan blade on the motor shaft and tighten set screws securely.
20. To install all previously removed parts, reverse the above steps.
21. Connect the oven to external power and press the POWER button ON to ensure the oven is operational.

Motor Small Fan Blade Installation

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Fan Motor Replacement procedure up to removing the small fan blade.
3. On the old motor, measure and note the distance from the end of the motor shaft to the outer edge of the small fan blade mounting clamp (typically 7-3/8 inches).
4. Loosen the mounting clamp set screw and slide the small fan off the motor shaft.
5. With the clamp facing away from the motor, slide the fan blade onto the motor shaft.
6. Position the small fan blade the distance measured during removal and tighten set screw securely.

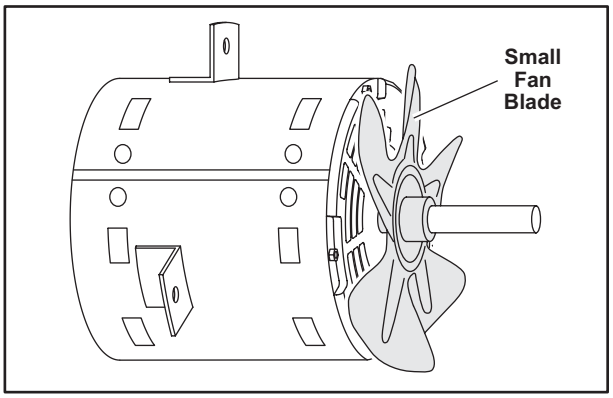


Figure 42: Small Fan Blade

Burner Area Access

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

WARNING

PERFORM THE GAS LOCKOUT/TAGOUT PROCEDURE.

WARNING

ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. DO NOT USE AN OPEN FLAME. USE A SOAP AND WATER SOLUTION AND CHECK FOR BUBBLES, WHICH INDICATE A GAS LEAK.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Gas Lockout/Tagout procedure, found on page 19 of this manual.
3. Perform the Internal Access procedure.
4. Perform the Fan Blade Removal procedure.
5. Remove 14 screws securing the burner access cover.

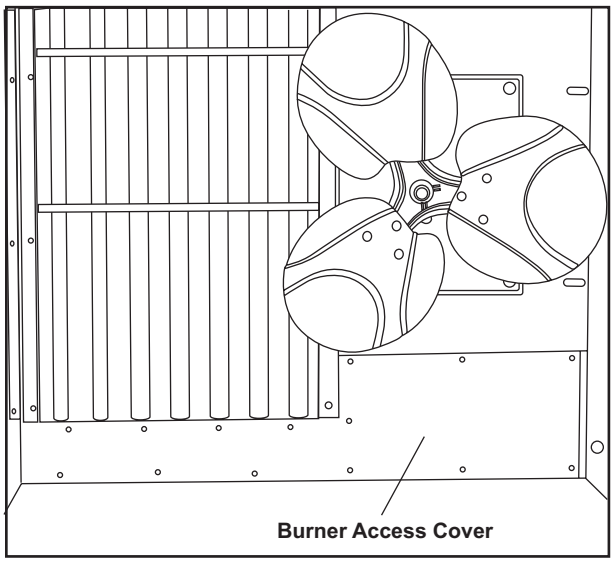


Figure 43: Burner Access Cover

Igniter Replacement

1. Perform the Burner Area Access procedure.
2. Remove the igniter (Figure 44) by removing the screw securing it to the burner.
3. Remove tie-straps securing the wires in the wiring harness.
4. Tag and disconnect igniter wiring.
5. Using tags created during removal, connect wires to the new igniter.
6. Position the igniter in the burner and secure with a screw.
7. To install all previously removed parts, reverse the above steps.
8. Turn the external gas supply ON, and press the POWER button ON to ensure the oven is operational.

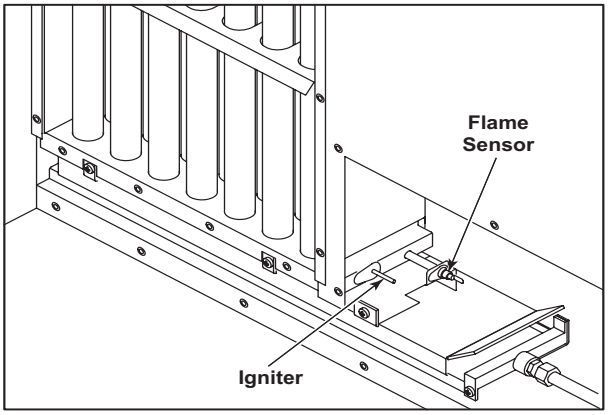


Figure 44: Igniter and Flame Sensor

Flame Sensor Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Internal Access procedure.
3. Perform the Burner Area Access procedure.
4. Remove the flame sensor (Figure 44) by removing the screw securing it to the burner.
5. Tag and disconnect the wire from the igniter.
6. Position the new igniter for installation and secure with a screw.
7. Using tag created during removal, connect the wire to the igniter.
8. To install all previously removed parts, reverse the above steps.
9. Turn the external gas supply ON and press the POWER button ON to ensure the oven is operational.

Burner Replacement

1. Perform the Burner Area Access procedure.
2. Perform the Flame Sensor Replacement procedure.
3. Perform the Igniter Replacement procedure.
4. Remove mounting screws from the igniter and flame sensor bracket and remove the bracket.

WARNING

DO NOT PLACE FINGERS UNDER THE BURNER. WHEN SCREWS ARE REMOVED THE BURNER WILL DROP FROM THE MOUNTING BRACKETS. SERIOUS PERSONAL INJURY MAY OCCUR TO FINGERS.

5. To avoid injury to fingers during removal, place a screwdriver under the left side of the burner (Figure 45).
6. Remove two screws securing the burner to the heat exchanger assembly.
7. Carefully slide the burner (Figure 46) out from under the heat exchanger.

8. Position the new burner for installation and secure the burner with two screws into the heat exchanger.
9. Ensure the burner is level before continuing.

NOTE: If the burner is installed at an angle it will NOT heat up the Flame Sensor Probe.

10. To install all previously removed parts, reverse the above steps.
11. Turn the external gas supply ON and press the POWER button ON to ensure the oven is operational.

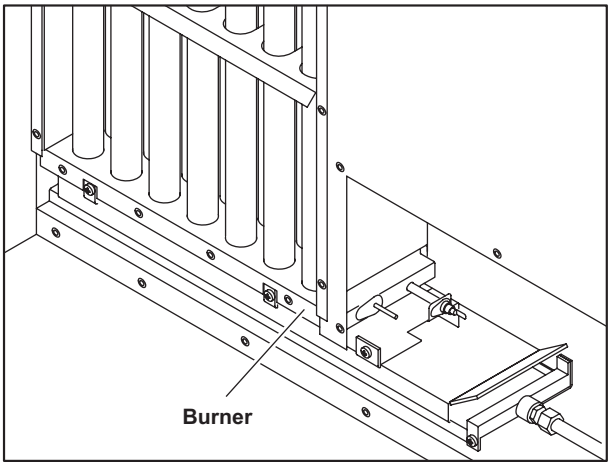


Figure 45: Burner Replacement

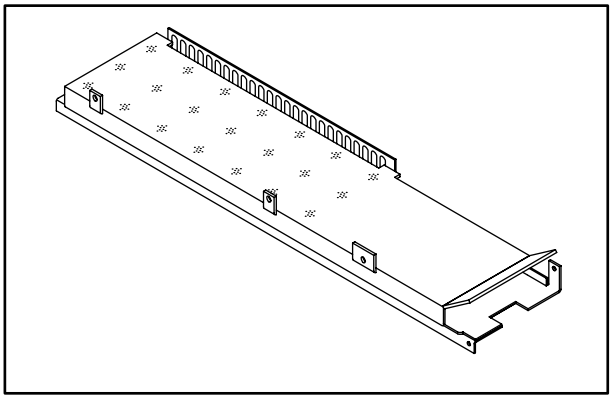


Figure 46: Burner

Heat Exchanger Replacement

WARNING

THE HEAT EXCHANGER IS VERY HEAVY. USE A BRACE UNDERNEATH THE HEAT EXCHANGER (FIGURE 48) FOR SUPPORT BEFORE REMOVING THE MOUNTING SCREWS.

1. Perform the Burner Replacement procedure.
2. Remove the top and middle left panel screws (Figure 47) near the heat exchanger.

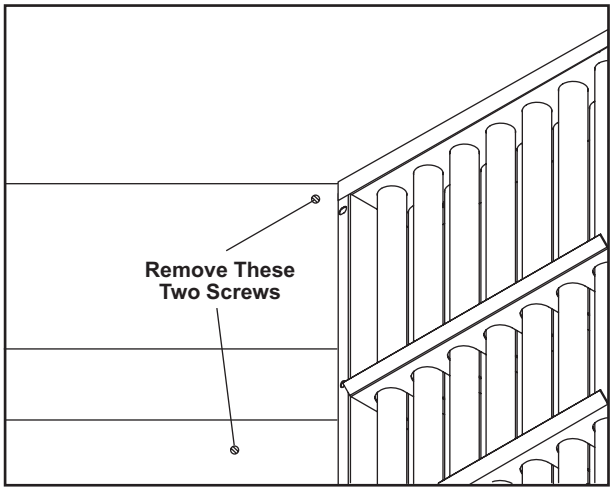


Figure 47: Left Panel Mounting Screws

3. Remove eight mounting screws from the sides of the heat exchanger.
4. Place the handle of a screwdriver under the brace (Figure 48) and apply upward pressure on the heat exchanger while removing four screws at the top.
5. Use the brace to support the heat exchanger while working it out of the mounting position.
6. Tilt the top of the heat exchanger assembly forward toward the oven doors and lay it down on the brace.
7. Carefully slide the heat exchanger assembly out of the oven.
8. Place the new heat exchanger assembly on the brace and slide it into the oven.
9. Tip the heat exchanger up and use the brace to carefully work it into position.

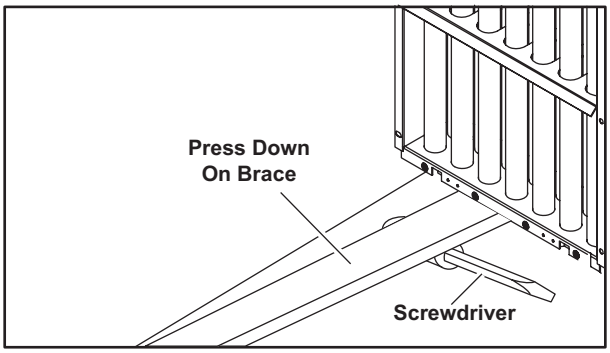


Figure 48: Heat Exchanger Removal and Installation

10. Place the handle of a screwdriver under the brace (Figure 48) and apply upward pressure on the heat exchanger while installing four screws at the top and eight screws on the sides.
11. To install all previously removed parts, reverse the above steps.
12. Turn the external gas supply ON and press the POWER button ON to ensure the oven is operational.

Steamer Assembly (Water Stall) Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Internal Access procedure.
3. Perform the Fan Blade Removal procedure.
4. Remove two screws and washers from the left side and four screws and washers from the right side of the steamer assembly (Figure 49).
5. Use a flat blade screwdriver to carefully pry the assembly away from the rear oven wall.

NOTE: *The steamer assembly water outlet tube at the bottom will slide out of the drain tube as the assembly is removed.*

6. Slide the steamer assembly towards the oven doors and remove it.
7. Position the new steamer assembly against the right side wall and push to the rear so the water outlet tube slides into position.
8. To install all previously removed parts, reverse the above steps.
9. Press the front panel POWER button ON to ensure the oven is operational.

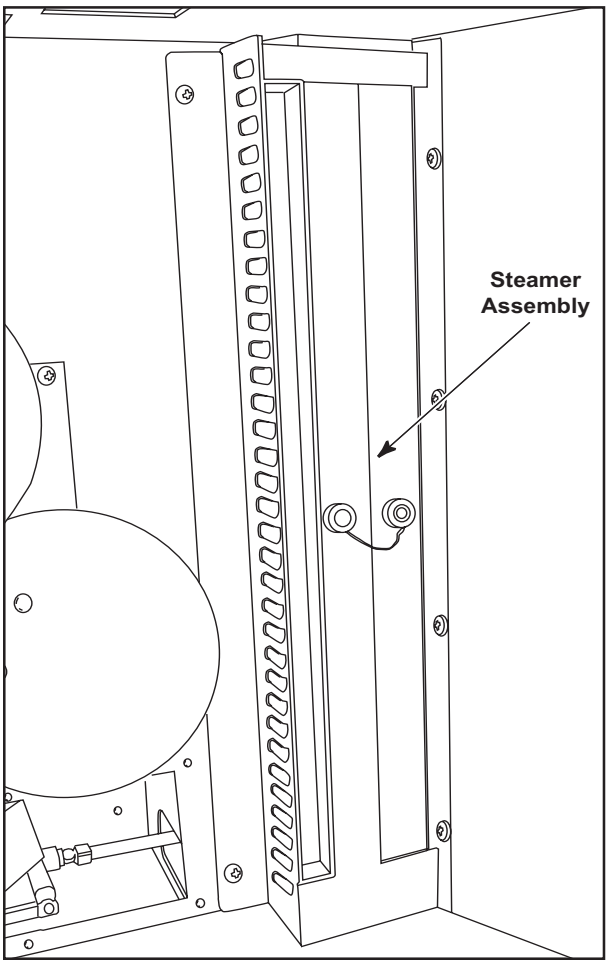


Figure 49: Steamer Assembly

Over-Temperature Switch Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Internal Access procedure.
3. Remove four mounting screws (Figure 50).
4. Carefully pull the switch and wires into the oven.
5. Tag and disconnect wires from the switch.
6. Using tags created during removal, connect the wires to the new switch.
7. Push excess wire back into the access hole.
8. Position the switch for installation and secure with four mounting screws.
9. To install all previously removed parts, reverse the above steps.
10. Turn the electric supply ON and press the POWER button ON to ensure the oven is operational.

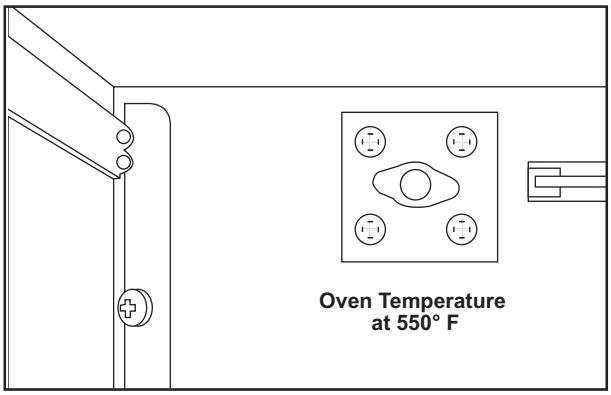


Figure 50: Over-Temperature Switch

Main Gas Solenoid Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

WARNING

PERFORM THE GAS LOCKOUT/TAGOUT PROCEDURE.

WARNING

ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. DO NOT USE AN OPEN FLAME. USE A SOAP AND WATER SOLUTION AND CHECK FOR BUBBLES, WHICH INDICATE A GAS LEAK.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Gas Lockout/Tagout procedure, found on page 19 of this manual.
3. Perform the External Right Side Panel Removal procedure.
4. Tag and disconnect wires from the main gas valve (Figure 51).

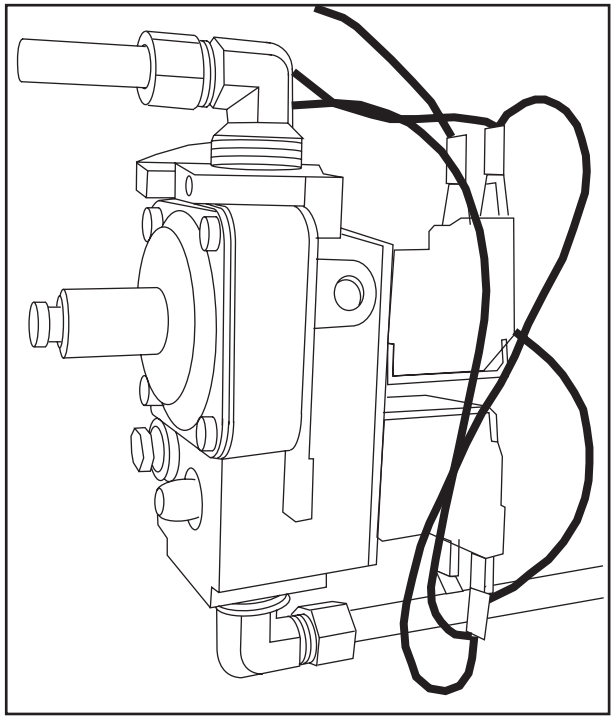


Figure 51: Main Gas Solenoid

5. Loosen two gas line fittings.
6. Remove two screws securing the gas valve bracket to the oven housing.
7. While supporting the gas valve, disconnect the two gas lines and remove the valve from the oven.
8. Remove the gas valve bracket from the old valve and secure it to the new one.
9. Insert two gas lines into the new gas valve.
10. Position the gas valve bracket on the oven housing and secure with two screws.
11. Tighten two gas line fittings.
12. Using tags created during removal, connect wires to the gas valve solenoids.

WARNING

ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. DO NOT USE AN OPEN FLAME. USE A SOAP AND WATER SOLUTION AND CHECK FOR BUBBLES, WHICH INDICATE A GAS LEAK.

13. Turn the external gas line valve ON and perform the Gas Leak Test at the input side of the new gas valve.
14. Turn the electric supply ON and press the POWER button ON to ensure the oven is operational.
15. Increase the oven temperature until the gas valve opens and the burner ignites.
16. Perform the Gas Leak Test at all visible gas connections.
17. Press the front panel POWER button OFF.
18. To install all previously removed parts, reverse the above steps.

Manual Gas Valve Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

WARNING

PERFORM THE GAS L O C K O U T / T A G O U T PROCEDURE.

WARNING

ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. DO NOT USE AN OPEN FLAME. USE A SOAP AND WATER SOLUTION AND CHECK FOR BUBBLES, WHICH INDICATE A GAS LEAK.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Gas Lockout/Tagout procedure, found on page 19 of this manual.
3. Turn OFF the electric supply to the oven.
4. Perform the Right Side Panel Removal procedure.
5. Remove the handle from the gas valve (Figure 52).
6. Loosen two gas line fittings on the manual gas valve.
7. Cut tie-straps (Figure 52) securing the manual gas valve to the backup control bracket.
8. Disconnect two gas lines and remove the valve from the oven.
9. Remove the handle from the new manual gas valve.
10. Position the new gas valve through the backup control bracket and attach the handle.
11. Install two gas lines into the valve and tighten securely.
12. Use two tie-wraps to secure the valve to the backup control bracket.
13. Turn the external gas line valve ON and perform the Gas Leak Test at both the input and output sides of the manual gas valve.

14. Press the POWER button ON to ensure the oven is operational.

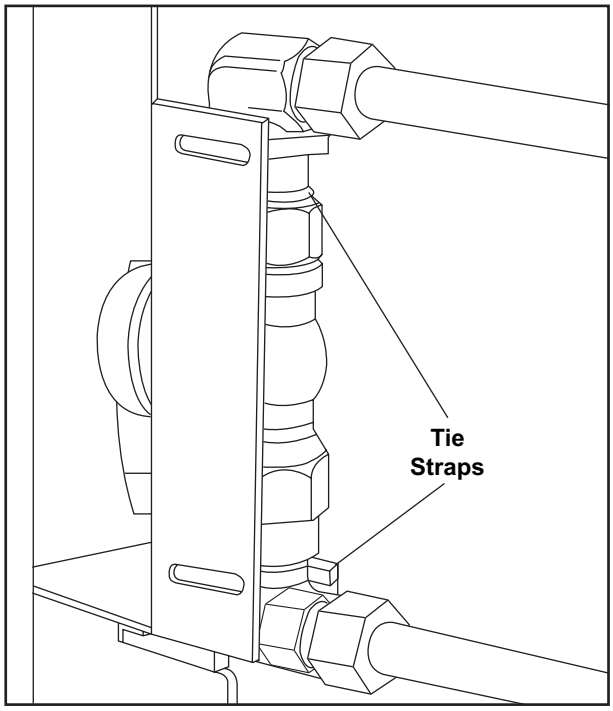


Figure 52: Manual Gas Valve

15. Adjust the oven temperature control to open the gas valve and ignite burner.
16. Perform the Gas Leak Test at all visible gas connections.
17. Turn the oven OFF.
18. To install all previously removed parts, reverse the above steps.

Water Solenoid Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Turn OFF water supply to the oven.
3. Perform the Electronics Access procedure.
4. Place a bucket under the water input, loosen the external water coupling and allow the water to drain from the water inlet line.
5. Perform the Right Side Panel Removal procedure.

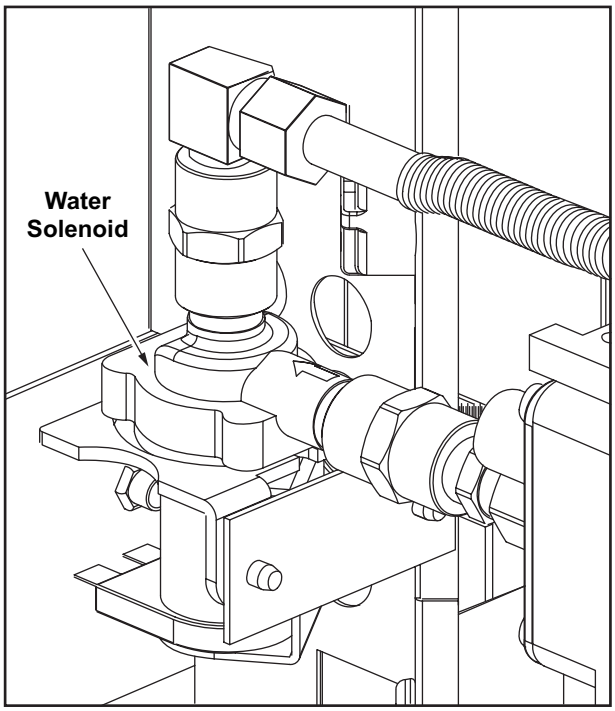


Figure 53: Water Solenoid

6. Tag and disconnect wires from the water solenoid (Figure 53).
7. Loosen the two water line fittings on side of the solenoid.

NOTE: *Expect some water leakage when* loosening the water line fittings.

8. Remove two screws securing the water solenoid to the mounting bracket.

9. Tag and disconnect two water lines from the solenoid.
10. Remove the solenoid from the oven.
11. Position the water solenoid for installation and secure with two screws.
12. Using tags created during removal, connect two water lines to the solenoid.
13. Using tags created during removal, connect wires to the solenoid.
14. Connect the exterior water line to the inlet pipe and turn the water ON.
15. Check for and repair any water leaks.
16. Connect the oven to external power and press the POWER button ON.
17. Place the MANUAL/BACKUP switch in the BACKUP position.
18. Press the BACKUP STEAM switch to activate the water solenoid and check for leaks.
19. Press the POWER button OFF to shut down the oven.
20. To install all previously removed parts, reverse the above steps.
21. Press the front panel POWER button ON to ensure the oven is operational.

Backup Thermostat Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Perform the Right Side Panel Removal procedure.
4. Place a small screwdriver behind the BACKUP THERMOSTAT knob and gently pry off.
5. Remove the two mounting screws.
6. Remove the thermostat from the back of the mounting plate.
7. Tag and disconnect wires from the thermostat.
8. Cut the tie-straps securing the thermostat tube (Figure 55).

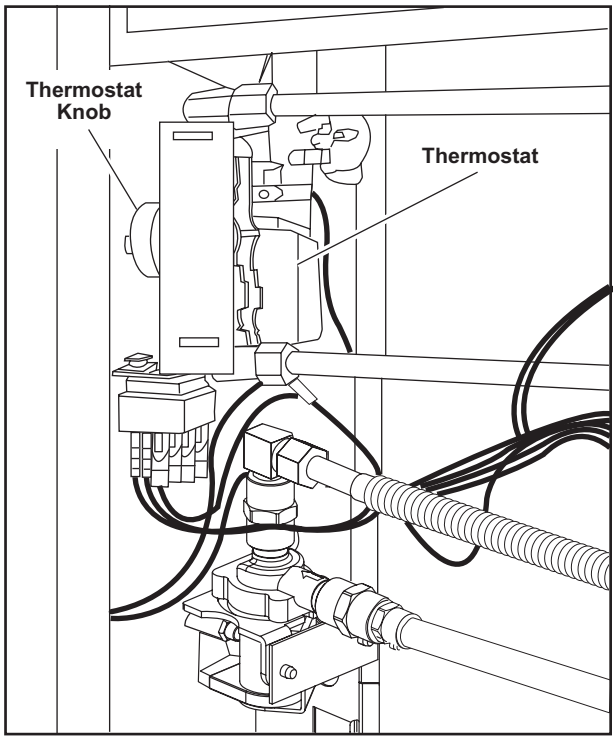


Figure 54: Thermostat Knob

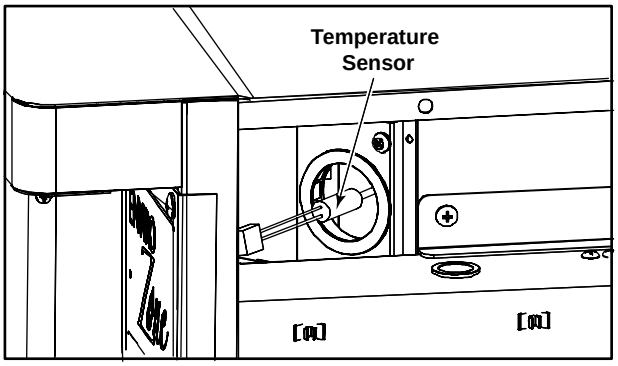


Figure 55: Thermostat Tube

9. Pull the coiled temperature probe and tubing out through the oven wall.
10. Remove the complete thermostat assembly from the oven.
11. Unwrap approximately 18 inches of temperature probe tubing on the new thermostat.
12. Using tags created during removal, connect wires to the new thermostat.
13. Being careful to not damage the temperature probe tubing, slide the probe through the oven wall.

NOTE: *Ensure wires are not pinched between the thermostat and the mounting plate.*

14. Position the thermostat for installation and secure with two screws.
15. Slide the control knob onto the shaft.
16. Inside the oven, route the probe through the mounting guides until the tip extends about 1½ inches past the third guide.
17. Wrap excess thermostat tubing and secure with tie straps.
18. To install all previously removed parts, reverse the above steps.
19. Connect the oven to external power and press the front panel POWER button ON to ensure the oven is operational.

Backup Steam Control Switch Replacement

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronic Access procedure.
3. Perform the Right Side Panel Removal procedure.

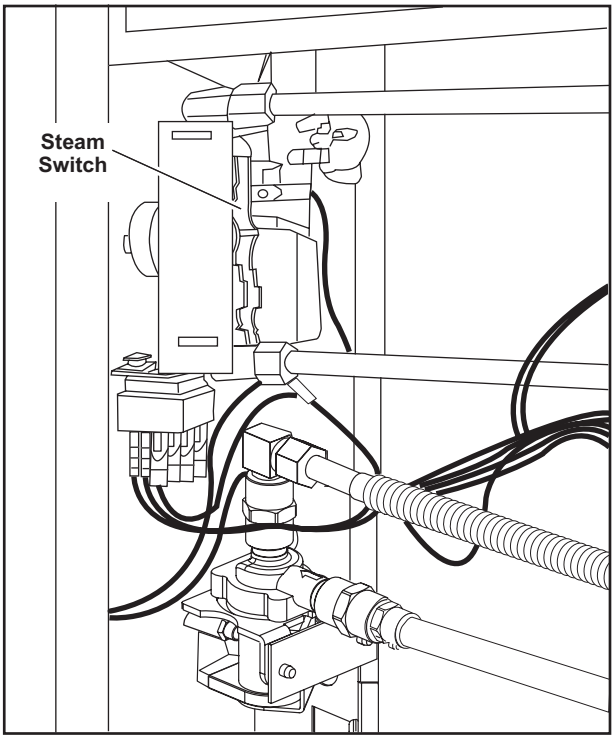


Figure 56: Steam Switch (Backup Controls)

4. Tag and disconnect wires from the switch (Figure 56).
5. Remove the mounting ring at the front of the toggle switch and pull the switch out through the mounting plate.
6. Using tags created during removal, connect wires to switch.
7. Insert shaft of the new switch through the mounting plate and install the mounting ring.
8. To install all previously removed parts, reverse the above steps.
9. Connect the oven to external power source and press POWER button ON to ensure the oven is operational.

Manual/Backup Switch Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronic Access procedure.
3. Perform the Right Side Panel Removal procedure.
4. Tag and disconnect wires from the MANUAL/ BACKUP switch (Figure 57).

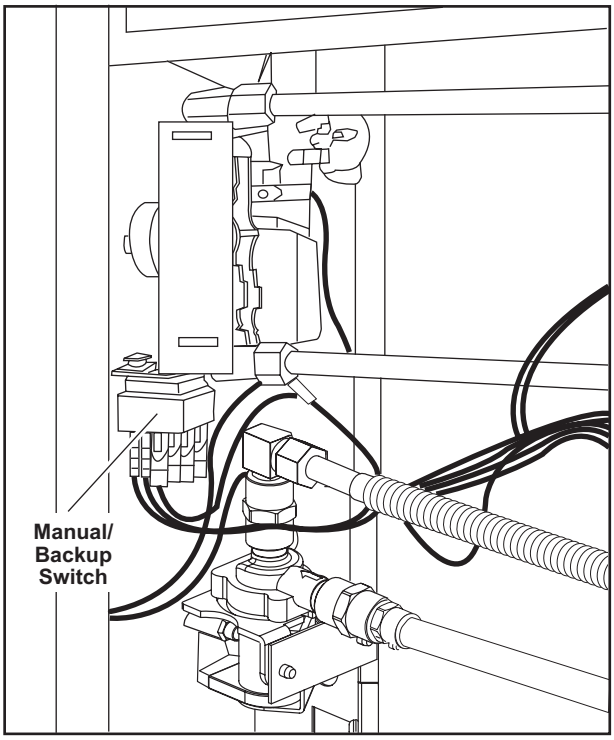


Figure 57: Manual/Backup Switch (Backup Controls)

5. Remove the mounting ring at the front of the switch and pull the switch down through the mounting plate.
6. Using tags created during removal, connect wires to the new switch.
7. Insert the shaft of the new switch through the mounting plate and install the mounting nut.
8. To install all previously removed parts, reverse the above steps.
9. Connect the oven to external power source and press the POWER button ON to ensure the oven is operational.

Oven Light Bulb Replacement

CAUTION

Ensure the power is OFF and the oven is cool before performing this procedure.

1. Locate the light (Figure 58) in the oven that is not illuminating.

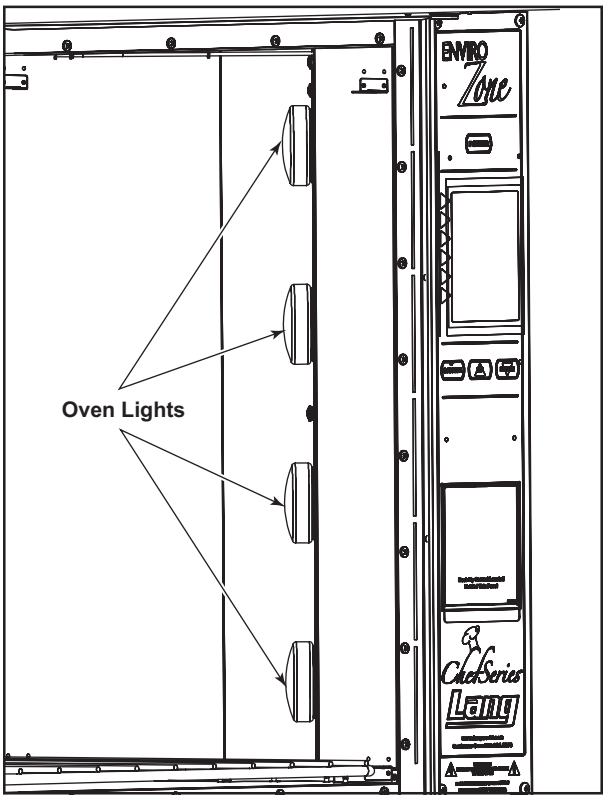


Figure 58: Oven Lights

2. Carefully turn the glass lens counter-clockwise and remove the lens and metal gasket from the socket assembly.

NOTE: Do not lose or discard the metal gasket. During replacement install the gasket with the lens.

3. Rotate the bulb counter-clockwise and remove it from the light socket.
4. Insert the replacement bulb into the socket and turn clockwise into the socket until tight.
5. Replace the glass lens and turn clockwise to tighten.
6. To install all previously removed parts, reverse the above steps.
7. Press the POWER button ON to ensure the oven light is operational.

Light Fixture Replacement

WARNING

PERFORM THE ELECTRICAL L O C K O U T / T A G O U T PROCEDURE.

CAUTION

This procedure can damage the porcelain finish around the lamp fixture. Use care to avoid or reduce damage.

1. Perform the Electrical Lockout/Tagout procedure, found on page 18 of this manual.
2. Perform the Electronics Access procedure.
3. Inside the electronics area, locate the defective light fixture.
4. Tag and disconnect two power connectors.
5. Inside the oven, locate the defective light and carefully turn the glass lens counter-clockwise to remove it from the light.
6. Rotate the bulb counter-clockwise and remove it from the light fixture.
7. Use a flashlight to illuminate the inside of the light fixture and locate the two pairs of interconnected tabs (Figure 59) securing the light fixture to the oven housing.

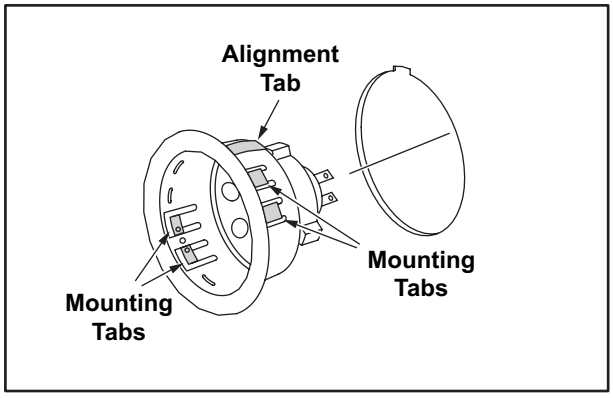


Figure 59: Light Fixture

8. Use a small screwdriver or similar tool to raise the two interconnected tabs along one side of the light fixture.
9. Insert a second screwdriver through one of the oval-shaped holes in the fixture to pry the edge of the fixture away from the oven housing.
10. When one side of the fixture is positioned away from the oven housing, use the small screwdriver to raise the tabs on the other side of the fixture and remove the fixture from the mounting hole inside the oven.
11. Hold the new light fixture with the alignment tab at the top.
12. Press the light fixture into the mounting hole until the tabs lock into position behind the oven housing.
13. Inside the electronics area, using tags created during removal connect the two power connectors to the new light fixture.
14. To install all previously removed parts, reverse the above steps.
15. Connect the oven to external power and press the POWER button ON to ensure the oven lights work.

Top Hinge Cover Removal

1. With the oven doors fully closed, remove the outer two mounting screws for the top hinge cover (Figure 60).
2. Open the oven doors all the way and remove the inner two mounting screws for the top hinge cover.
3. Slide the top hinge cover forward and away from the oven.
4. To install, reverse the above steps.

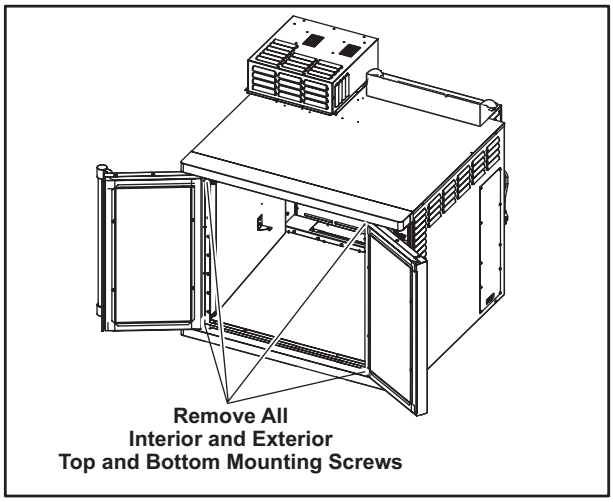


Figure 60: Hinge Cover Mounting Screws

Bottom Hinge Cover Removal

1. With the oven doors fully closed, remove the outer two mounting screws for the bottom hinge cover (Figure 60).
2. Open the oven doors all the way and remove the inner two mounting screws for the bottom hinge cover.
3. Remove six mounting screws and the bottom door gasket.

CAUTION

This hinge cover fits snugly. Use care to not damage parts or injure knuckles.

4. Slide the bottom hinge cover forward and away from the oven.
5. To install, reverse the above steps.

Door Chain and Turnbuckles Removal

1. Perform the Bottom Hinge Cover Removal procedure.
2. Ensure the oven doors are fully closed.
3. Locate the door chain and count the number of chain link pins (typically 8) found between the end of the turnbuckle and the gear tooth that faces out, perpendicular to the door.

NOTE: *When assembly is performed, ensure the chain is in this same position.*

4. Loosen the locking nut seated against one of the two turnbuckles.
5. Loosen turnbuckle until the turnbuckle and threaded shaft separate and loosen the chain from the associated gear.

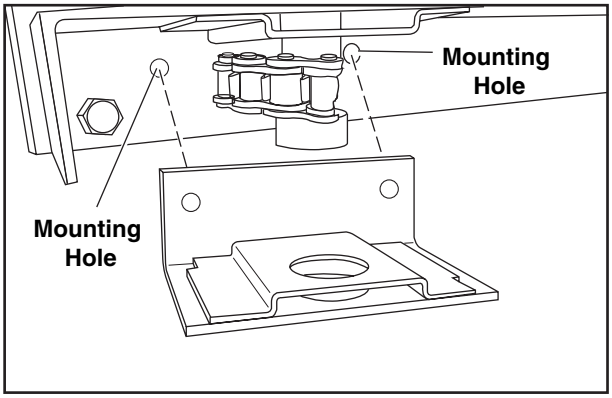


Figure 61: Bushing Plate Location

6. Behind the chain and gear, remove two bolts and lock washers holding the lower door bushing plate (Figure 61) against the oven frame.

CAUTION

Use care to prevent the door chain and turnbuckles assembly from falling away from the oven and causing any damage.

7. Gently pry the bushing plate down and away from the door post and bushing.
8. Repeat steps 5 and 6 to remove the other lower door bushing plate and remove the chain and turnbuckle assembly.
9. When assembly is performed, ensure the two turnbuckles are properly adjusted so the doors close together, the right door swings into place first.
10. To install, reverse the above steps.

Left Oven Door Removal

1. Perform the Top Hinge Cover Removal procedure.
2. Perform the Bottom Hinge Cover Removal procedure.
3. Perform the Door Chain & Turnbuckles Removal procedure.
4. Open oven doors to relieve spring tension.
5. Place left door in the closed position.
6. Locate the top door hinge mounting plate and loosen but do not remove three mounting bolts.
7. On the larger bottom door hinge mounting plate, loosen but do not remove two mounting bolts.

CAUTION

Use an assistant to perform steps 8 and 9.

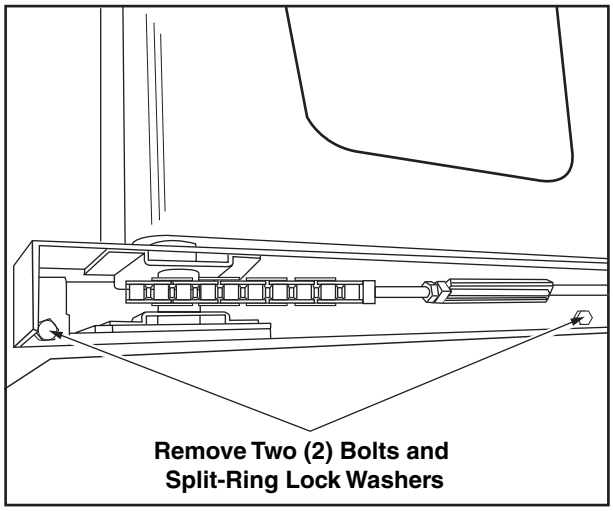


Figure 62: Left Door Bottom Mounting Plate

8. While an assistant supports the door, remove two bolts from the bottom plate.
9. Carefully lower the door while removing the post from the top door hinge plate, and remove from the oven.
10. To install, reverse the above steps.

Door Switch

WARNING

PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE.

1. Perform the Electrical Lockout/Taggout procedure, found on page 18 of this manual.
2. Perform the Top Hinge Cover Removal procedure.
3. Tag and disconnect wires from the switch.

NOTE: Access to the left screw is provided through a hole in the door hinge mounting plate.

4. Remove screws and nuts securing the switch to the bracket.
5. To install, reverse the above steps.

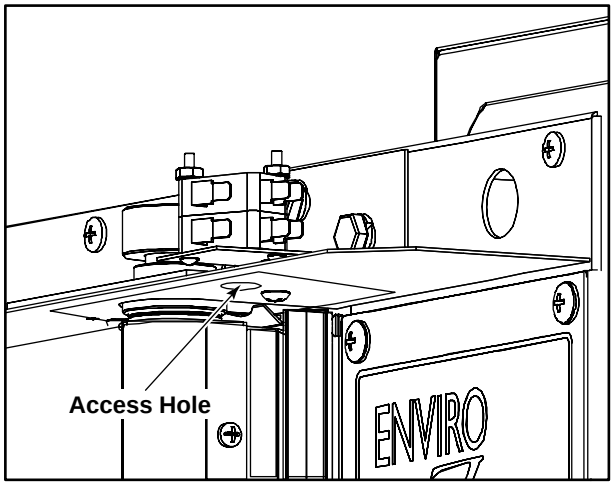


Figure 63: Door Switch

Right Oven Door Removal

1. Perform the Top Hinge Cover Removal procedure.
2. Perform the Bottom Hinge Cover Removal procedure.
3. Perform the Door Chain & Turnbuckles Removal procedure.
4. Open the oven doors to relieve spring tension.
5. Locate the brass bushing and circular clamp at the top of the right door hinge post (Figure 64).
6. Matchmark the brass bushing and circular clamp (Figure 64).

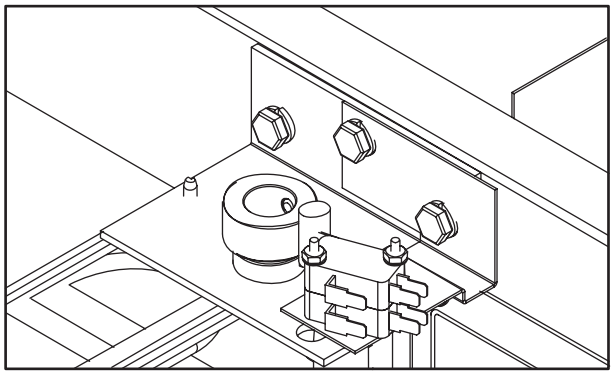


Figure 64: Right Door Hinge Bushing & Clamp

7. Loosen the circular clamp bolt and remove the clamp.
8. Close the right door.
9. Locate the top door hinge mounting plate and loosen but do not remove three mounting bolts.
10. Locate the bottom door hinge mounting plate (Figure 65) and loosen but do not remove four mounting bolts.

CAUTION

Use an assistant when performing steps 11 and 12.

11. While an assistant supports the door, remove four bolts from the bottom mounting plate.

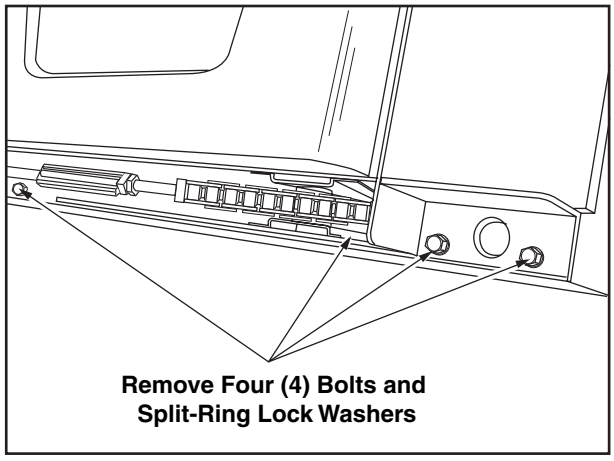


Figure 65: Right Door Bottom Mounting Plate

12. Carefully lower the door while removing the post from the top door hinge.
13. Reverse above steps to reassemble.
14. During assembly, ensure the circular clamp is positioned to properly activate the door switch (Figure 66).

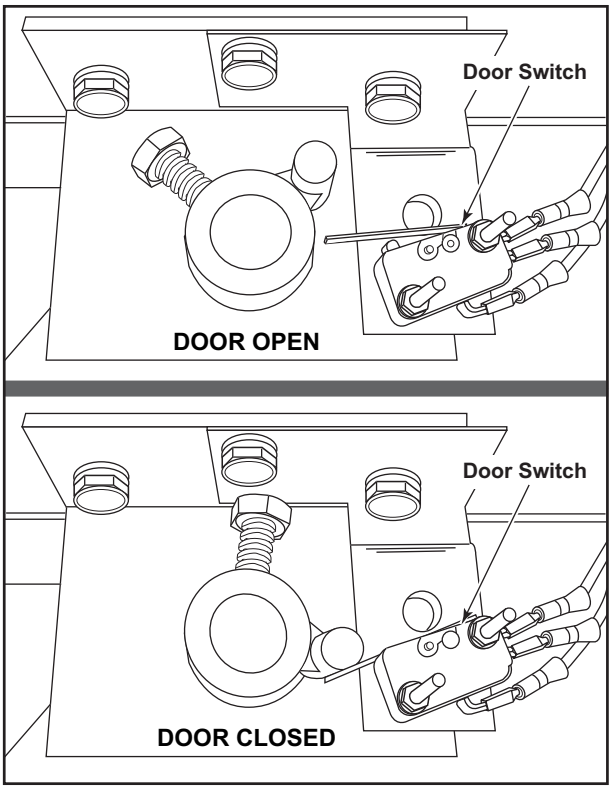


Figure 66: Circular Clamp Position

TROUBLESHOOTING

CAUTION

Only qualified service technicians should perform tests listed in this troubleshooting table.

Maintenance and service on this appliance should be performed only by qualified service technicians trained in appliance and test equipment operation and diagnostic and safety procedures.

This troubleshooting table does not cover every possible problem or condition that may occur during operation. Qualified service technicians can perform tests and determine the necessary action for problems not listed in the table.

OVEN PROBLEMS

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDY
Oven does not turn ON	Oven unplugged	Plug in oven.
	Bad cord/ plug	Replace cord/plug.
	Tripped switch in circuit breaker box	Reset switch.
	Blown fuse	With AC power disconnected, use an Ohmmeter to check for an open fuse. Replace fuse, if necessary.
	Bad primary transformer	Check transformer input leads for 120 VAC. If the voltage is correct, disconnect AC power and check the resistance across the transformer primary. • If open, replace transformer. If the voltage is not correct, check for open circuit between AC inputs and the transformer.
	Bad secondary transformer	With the MANUAL/BACKUP switch in MANUAL position, check for 24 VAC from pin 1 to pin 3 on the 15-pin cable. Check for 12 VAC between pins 1 and 2 and between pins 2 and 3. If the voltage is not correct, replace transformer.

OVEN PROBLEMS (Cont.)

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDY
Oven does not heat	Over-temperature switch is tripped	With power switch ON, use a voltmeter to check voltage across wires 37 and 45. If voltage is available, replace the over-temperature switch.
	Bad temperature probe	Preheat oven to 350° F and disconnect the temperature probe cable from the circuit board. Use an Ohmmeter to check resistance across the probe leads. If probe resistance is higher or lower then 982.7 ±5 Ohms, replace the probe.
	Bad igniter	With the power switch ON, check for 24 VAC between wire 52 (ignition control module S1 terminal) and ground. If voltage is present and the igniter does not glow replace the igniter.
	Bad ignition control module	Check wires 30 and 34, (S1 and Ground), at the ignition control module for 24 VAC. If available, check wires 55 and #34, MV1 and Ground, for 24 VAC. If available, check the igniter or gas solenoid.
	Bad gas solenoid	Disconnect AC power from the oven and remove wires 55 and 34 from the coils on the gas solenoid and measure resistance of each coil. If a coil is open or shorted, replace the gas solenoid.
	Bad draft inducer fan	With the power switch ON, check for voltage on wire 51 to ground for 120 VAC. If available and motor is not working, replace draft inducer fan motor.
	Bad draft inducer air proving switch	With the power switch OFF, remove wires 54 and 34 from the air switch. Use an Ohmmeter to check switch continuity. Place the wires back on the air switch and turn the oven ON. Wait for the draft inducer to turn ON and check for 24 VAC at wire 54. If the reading is correct, the air switch is good.

OVEN PROBLEMS (Cont.)

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDY
Oven heats up but fan motor will not work	Bad motor run relay (MR2)	With the power switch OFF, use an Ohmmeter to check 35 Ohms resistance at the motor run relay (MR2) coil between wires 34 and 35 . If open, replace the relay.
	Bad motor capacitor	With the power switch OFF, perform a capacitance test on the capacitor. Replace the capacitor if defective.
	Bad main motor	With the oven ON, check for 120 VAC between motor at wire 11 and N-Wht or ground. If available and motor is not running, replace motor.
Oven continues to heat	Bad temperature probe	Preheat oven to 350° F. Disconnect the temperature probe cable from the circuit board. Use an Ohmmeter to check resistance across the probe leads. If resistance is higher or lower than 982.7 ±5 Ohms, replace the probe.
	Bad gas solenoid	With the oven ON, check voltage between wires 55 and 34 on the gas solenoid. If 24 VAC is not available replace the gas solenoid. If voltage is available, check the circuit board.
	Bad circuit board	With the oven ON, check pin 5 (wire 39) for 24 VAC on the circuit board. If 24 VAC is available and oven is at temperature, replace the circuit board.

OVEN PROBLEMS (Cont.)

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDY
Motor runs only in one direction	Bad motor FWD/REV relay (MR1)	With the power switch OFF, use an Ohmmeter to check for 35 Ohms resistance at the motor run relay (MR2) coil between wires 34 and 35 . If relay is open, replace the relay.
	Bad FWD/REV relay (MR1)	With the power switch OFF, perform a capacitance test on the capacitor. Replace the capacitor if defective.
	Bad circuit board	With oven ON, check for 24 VAC at motor wire 41 and ground. After two minutes voltage should drop off, if not replace circuit board.
Motor runs constantly	Bad temperature probe	With oven OFF and oven temperature under 250 degrees F, the fan should not run. Check the resistance of the Temperature Probe. Preheat oven to 350° F and disconnect the temperature probe cable from the circuit board. Use an Ohmmeter to check resistance across the probe leads. If resistance is higher or lower than 982.7 ±5 Ohms, replace the probe.
	Bad motor run relay (MR2)	With the oven ON, check 24 VAC between wires 25 and 34 on the MR2 relay. If voltage is present replace MR2 relay.
	Bad circuit board	With the oven OFF, check for 24 VAC at pin 5 (wire 39) on the circuit board. If 24 VAC is available and oven is at temperature, replace the circuit board.

OVEN PROBLEMS (Cont.)

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDY
Motor only runs on low speed	Incorrect wiring at high/low speed relay	Ensure wiring is correct as per electrical schematic, correct as necessary.
	Bad motor high/low speed relay (MR3)	With the oven ON, verify that 24 VAC is present on relay (MR3) coil wires 48 and 32. If voltage is available, switch speed to HIGH. Voltage should drop off. If voltage does not drop off check the touch pad or circuit board.
	Bad circuit board	With the oven ON, check pin 13 (wire 48) for 24 VAC. Voltage (24 VAC) should be present when LOW speed is selected. If voltage is available, check the relay.
	High/Low speed relay is wired wrong	Ensure wiring is correct per electrical schematic, correct as necessary.
	Bad motor high/low speed relay (MR3)	With the oven ON, check for 24 VAC at relay (MR3) coil wires 48 and 32. If voltage is not available switch speed to LOW. 24 VAC should be available. If voltage drops off check wiring of relay.
	Bad circuit board	With oven ON, check pin 13 (wire 48) for voltage. Voltage should not be present when HIGH speed is selected. If no voltage is present, check the relay.
Motor runs with door open	Bad door switch	With power OFF and the doors closed, use an Ohmmeter to check continuity across the door switch. Continuity should be available. With the doors open there should be no continuity. If necessary, replace the door switch.

OVEN PROBLEMS (Cont.)

SYMPTOMS	POSSIBLE CAUSE	SUGGESTED REMEDY
Oven does not create steam	External water valve OFF	Turn the external water valve ON.
	Bad/dirty external water filter	Check the external water filter. Replace the filter as needed.
	Bad water solenoid (SV1)	With oven ON and in steam mode, check for 24 VAC between water solenoid wires 43 and 32. If voltage is available, replace the water solenoid.
	Bad circuit board	With oven ON and in steam mode, check for 24 VAC between water solenoid wires 43 and 32. If voltage is not available, replace the circuit board.
Oven creates steam at all times	Water pressure to high	Regulate incoming water pressure to 20 to 80 psi.
	Bad water solenoid (SV1)	With oven ON and not in steam mode, check for 24 VAC between water solenoid wires 43 and 32. If voltage is not available, replace the solenoid.
	Bad circuit board	With oven ON and not in steam mode, check for 24 VAC between wires 43 and 32. If voltage is present replace the control circuit board.
	Bad light relay (LR1)	With the oven OFF, use an Ohmmeter to check resistance of light relay (LR1) coil between wires 42 and 32. Resistance should be 35 ohms. Replace the relay if open. If resistance is 35 ohms connect wires 42 and 32 to the relay. Turn the oven ON and check for 24 VAC between the wires. If 24 VAC is available, replace the light relay (LR1).
	Bad light bulbs	Check bulbs, and replace as needed.

IGNITION CONTROL MODULE PROBLEMS

CAUTION

Only qualified service technicians should perform tests listed in this troubleshooting table.

Maintenance and service on this appliance should be performed only by qualified service technicians trained in appliance and test equipment operation and diagnostic and safety procedures.

This troubleshooting table does not cover every possible problem or condition that may occur during operation. Qualified service technicians can perform tests and determine the necessary action for problems not listed in the table.

SYMPTOM	POSSIBLE CAUSE	SUGGESTED REMEDY
Does not start	Miswired Bad 24 VAC transformer Bad fuse/circuit breaker Bad controller, check LED for steady on or flashing codes	Check wiring and correct. Replace transformer. Replace fuse or circuit breaker. Replace controller.
Thermostat ON – no ignition	Miswired Bad thermostat, no 24 VAC at thermostat terminal W Failed igniter	Check wiring and correct. Replace thermostat. Check Air Switch.
Valve ON – no igniter	Bad igniter Miswired Bad controller, check voltage at igniter	Check for 24VAC at S1 and wire 34. Check wiring and correct. Replace controller.
Igniter ON – no valve	Valve coil open Open valve wire Bad controller, check voltage at gas valve terminal for 24V	Replace coil. Replace wire. Replace controller.
Flame okay during TFI – no flame sense after TFI	Bad igniter Bad S2 Sensor wire Poor ground at burner Poor flame, check flame current as indicated below	Replace igniter. Clean flame sensor and check wire to S2. Repair ground. Perform Flame Sensor Current Test if necessary replace module.

Flame Sensor Current Test

Flame current is the current that passes through the flame from the sensor to ground. The minimum flame current necessary to keep the system from lockout is 1.0 micro amp. To measure flame current, connect an analog DC micro-ammeter to the FC terminals on the ignition control module (Figure 67). The meter reading should be 1.0 micro amp or higher.

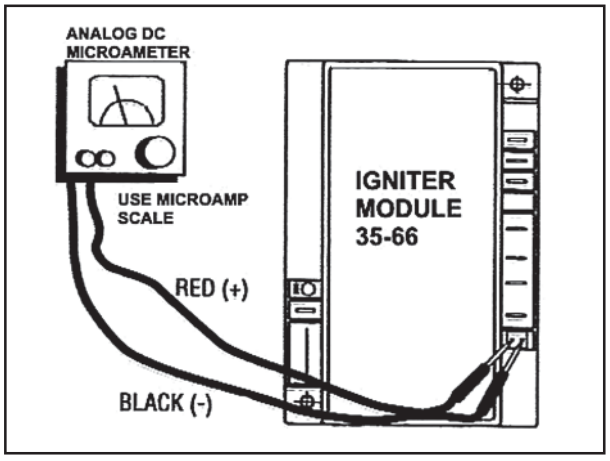
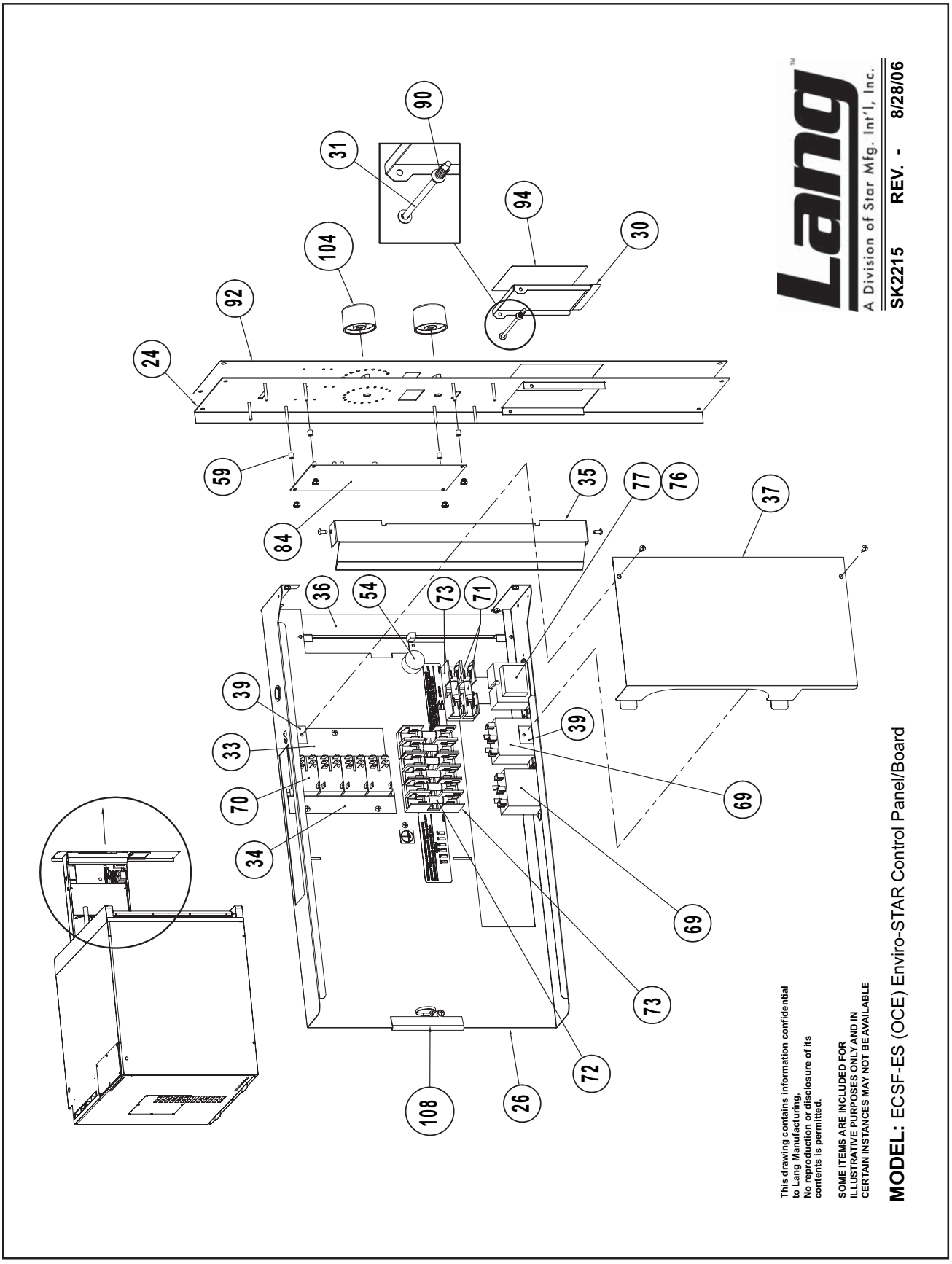
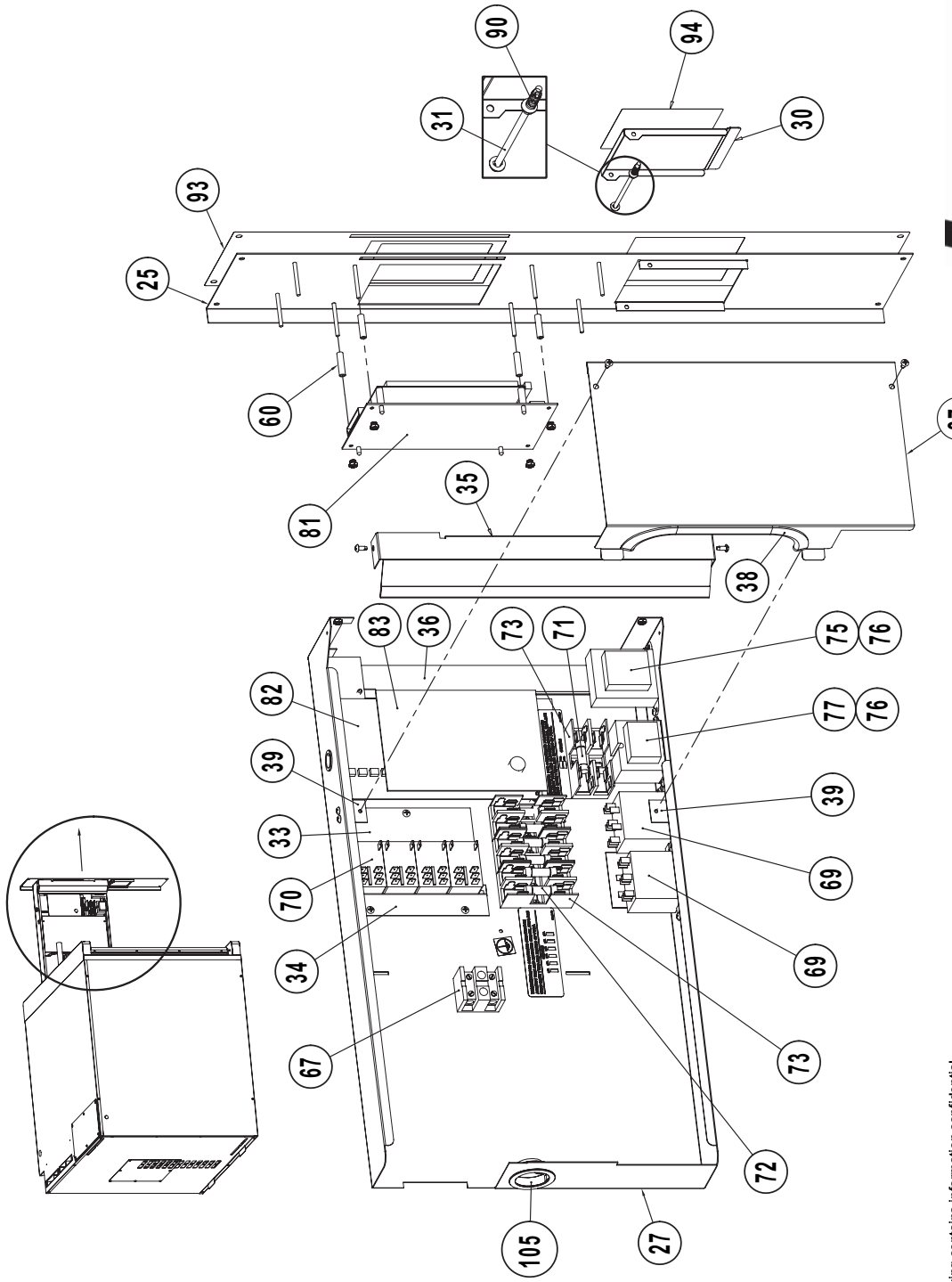


Figure 67: Flame Sensor Current Test

NOTES

ILLUSTRATED PARTS REFERENCE





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MODEL: ECSF-EZ (OCE) Enviro-ZONE Control Panel/Board

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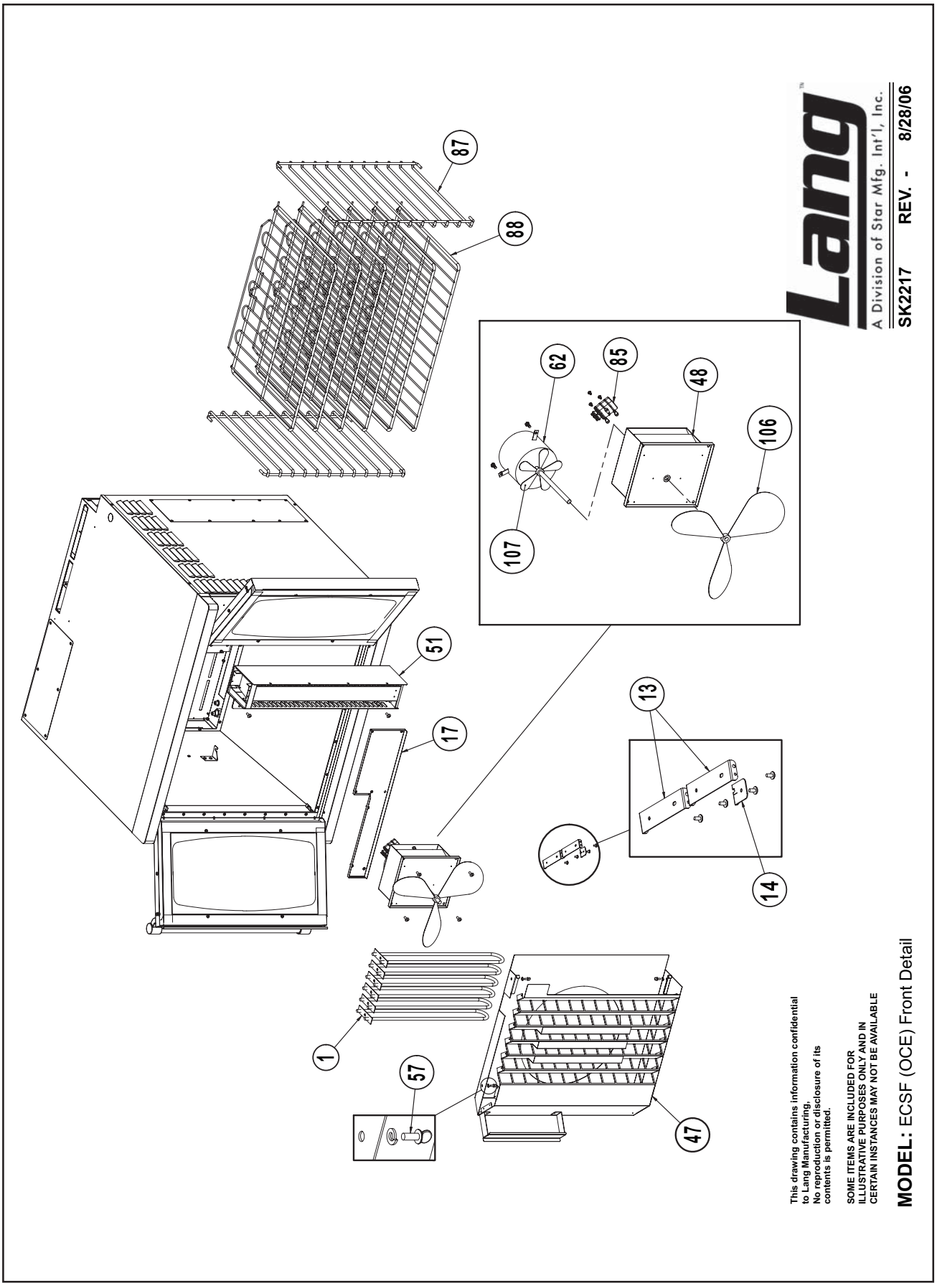
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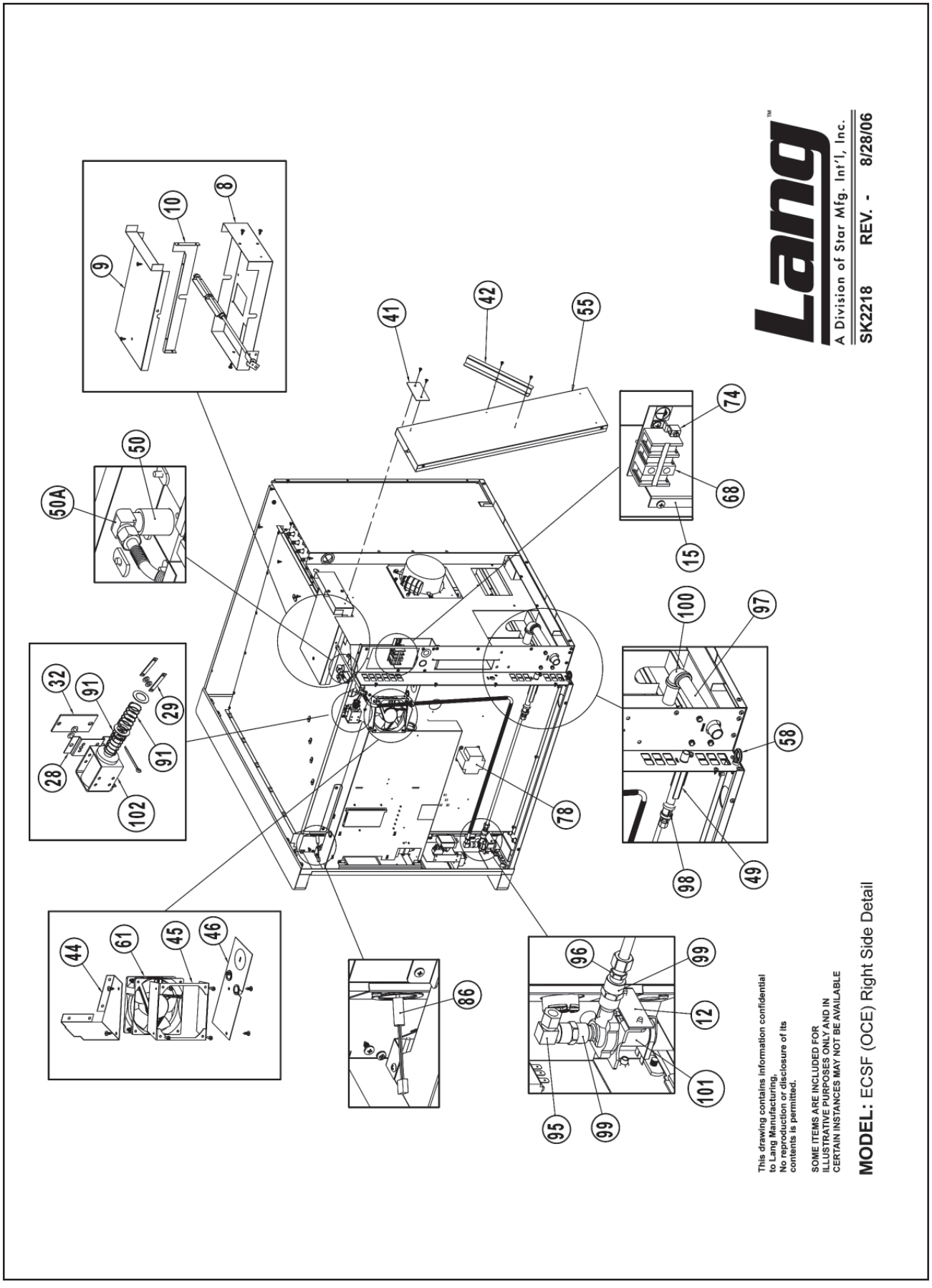
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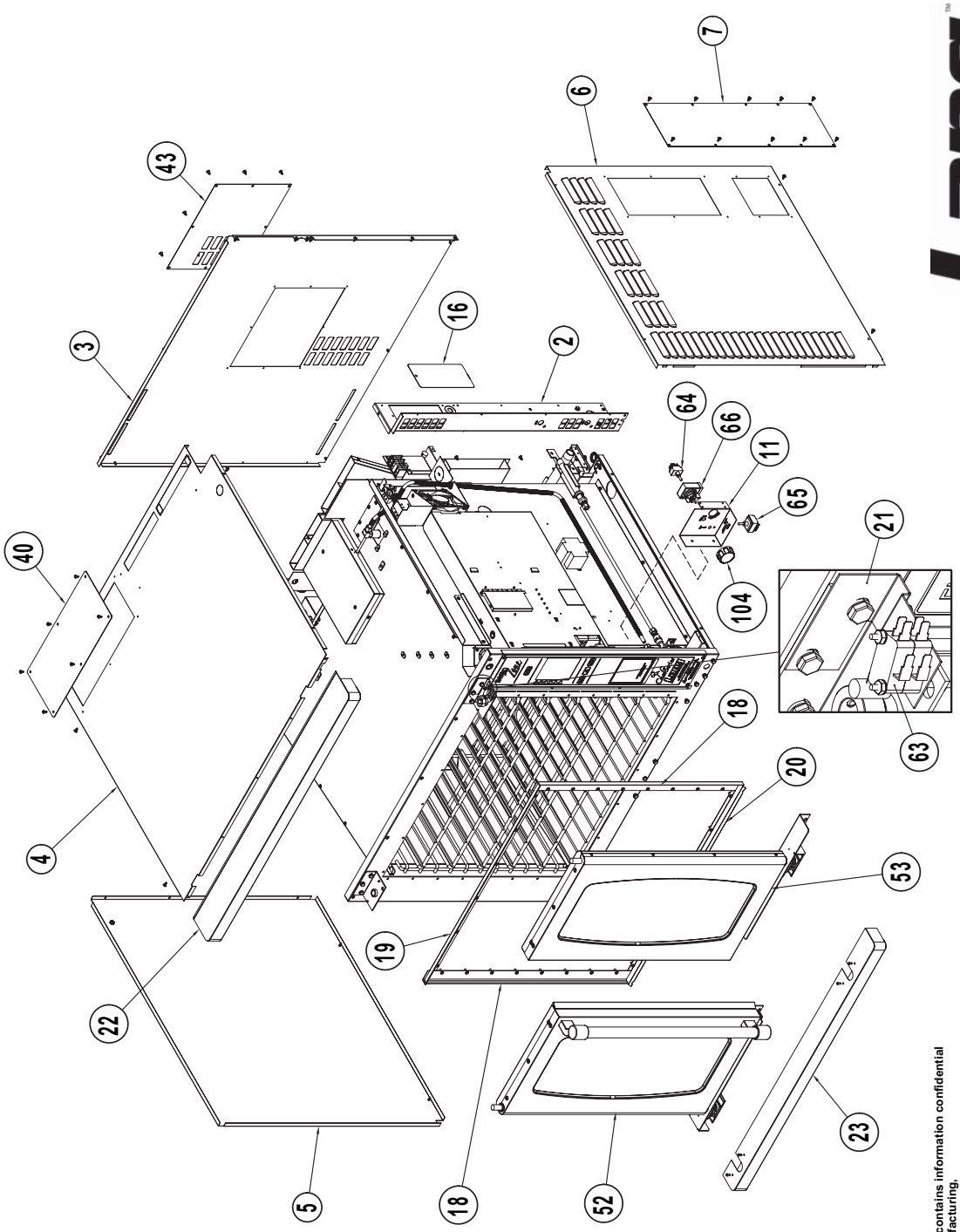
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ENVIROSTAR PARTS REFERENCE

Fig No	Part Number	QTY	Description	Where Used
1	2N-11090-37	6	ELE U-SHPE OCE 2600W@240V	ALL
2	Q9-146-102-1	1	RIGHT REAR CORNER	ALL
3	Q9-146-102-2	1	BODY BACK	ALL
4	Q9-146-103	1	BODY TOP - OCE	ALL
5	Q9-146-104	1	BODY LEFT SIDE	ALL
6	Q9-146-105-2	1	BODY RH SIDE W/AVK	ALL
7	Q9-146-105-01	1	RH SIDE ACCESS COVER	ALL
8	Q9-146-126 Q9-146-126-1	1 1	BOTTOM POWER VENT E-Z BOTTOM POWER VENT E-S	ECSF-EZ
9	Q9-146-127	1	TOP POWER VENT	ALL
10	Q9-146-128	1	DIVIDER POWER VENT	ECSF-EZ
11	Q9-146-149-1	1	BACKUP CONTROL BRACKET	ALL
12	Q9-146-150	1	WATER SOLENOID BRACKET	ALL
13	Q9-146-160	2	PROBE HOLDER	ALL
14	Q9-146-161	1	PROBE CLAMP	ALL
15	Q9-146-162	1	SERVICE ENTRANCE BOX	ALL
16	Q9-146-163	1	SERVICE ENTRANCE COVER	ALL
17	Q9-146-165-1	1	BURNER ACCESS COVER	ALL
18	Q9-146-316	2	DOOR GASKET SIDES	ALL
19	Q9-146-317	1	DOOR GASKET TOP	ALL
20	Q9-146-318	1	DOOR GASKET BOTTOM	ALL
21	Q9-146-322	1	DOOR SWITCH BRACKET	ALL
22	Q9-146-330	1	HINGE COVER TOP	ALL
23	Q9-146-331	1	HINGE COVER BOTTOM	ALL
24	Q9-146-350	1	CONTROL PANEL - ENVIRO	
25	Q9-146-350-1	1	CONTROL PANEL - ENVIRO	ECSF-EZ
26	Q9-146-351	1	COMPONENT MOUNT ENVIRO	
27	Q9-146-351-1	1	COMPONENT MOUNT ENVIRO	ECSF-EZ
28	Q9-146-352-1	1	BRACKET - VENT SOLENOID	ECSF-EZ

Fig No	Part Number	QTY	Description	Where Used
29	Q9-146-355-2	2	ACTUATOR ARM - POWER VENT	ECSF-EZ
30	Q9-146-356	1	COVER CONTROL PANEL DOOR	ALL
31	Q9-146-357	1	BACK UP DOOR HINGE ROD	ALL
32	Q9-146-358	1	VENT SOLENOID SHIM	ECSF-EZ
33	Q9-146-359	1	RELAY CLAMP	ALL
34	Q9-146-360	1	RELAY CLAMP BASE	ALL
35	Q9-146-361	1	PC BOARD HEAT SHIELD	ALL
36	Q9-146-362	1	PC BOARD PROTECTOR	ALL
37	Q9-146-363	1	COMPONENT WIRE COVER	ALL
38	Q9-146-363-1	1	TRIMLOCK 8.750	ALL
39	Q9-146-364	2	COMPONENT WIRE COVER CLIP	ALL
40	Q9-146-407	1	ELEMENT TOP ACCESS COVER	ALL
41	Q9-146-408	1	VENT PASSTHROUGH UPPER	ALL
42	Q9-146-409	1	REAR PANEL STANDOFF ANGLE	ALL
43	Q9-146-413	1	ACCESS PANEL - MOTOR	ALL
44	Q9-146-490	1	CTRL PANEL COOLING FAN	ECSF-EZ
45	Q9-146-491	1	CTRL PANEL COOLING FAN	ECSF-EZ
46	Q9-146-493	1	CTRL PANL FAN BTM	ECSF-EZ
47	Q9-146-720	1	INTAKE COVER ASSY	ALL
48	Q9-146-736	1	MOTOR BRACKET WELD	ALL
49	Q9-146-737	1	WATER INLET WELDMENT	ALL
50	Q9-146-738	1	WATER INLET ASSY	ALL
50A	2K-70101-04	1	BRAS TBE ELBW 3/8NPTM-3/8	ALL
51	Q9-146-740	1	STEAMER ASSY	ALL
52	Q9-146-745	1	DOOR ASSY LH	ALL
53	Q9-146-750	1	DOOR ASSY RH	ALL
54	2J-30802-08	1	BEEPER 3-24 VDC PIEZO PNL	NOT ON THE ECSF-EZ
55	Q9-146-765	1	STACKING VENT ASSY	ALL
56	Q9-146-768	1	LIGHT RETAINER ASSY	ALL
57	2C-20112-03	5	SCRW THUMB 1/4-20X1/2 SS	ALL
58	2C-20119-01	1	EYEBLTFORGD/SHLDR1/4-20X1	ALL

Fig No	Part Number	QTY	Description	Where Used
59	2A-20501-05	4	SPCR FBR 1/4 OD #6 ID 1/4	ALL
60	2A-20504-02	4	SPACER NYLON #6 1/4 X 1	ALL
61	2U-30200-46	1	MTR W/FAN AXIAL 220VAC70C	ECSF-EZ
62	2U-30200-67 2U-30200-69	1 1	MOTOR OCE 208/240V MOTOR OCE 480V	 ECSF-ES-480V
63	2E-30301-19 2E-30301-19	2 3	SWT MIN. LEVER ACTUAT SWT MIN. LEVER ACTUAT	 ECSF-EZ
64	2E-30303-16	1	SWT TOG ON-ON BLK MOM	ALL
65	2E-30303-26	1	SWITCH 3PDT	ALL
66	2T-30402-27	1	STAT ADJ 450 DEG 48 PILOT	ALL
67	2E-30500-08	1	TRM BLOCK 2 POLE SMALL 95	ECSF-EZ
68	2E-30500-09	1	TRM BLOCK 3 POLE SMALL 95	
69	2E-30700-06 2E-30700-06	2 4	CONTC 3 POLE 35A 24 VAC 50/60 HZ CONTC 3 POLE 35A 24 VAC 50/60 HZ	 ECSF-EZ
70	2E-30701-05	4	CONTC 2POLE 30A 24 VAC P &	
71	2E-30900-10 2E-30900-10	2 1	FUSE 15AMP 300V (SC-15) FUSE 15AMP 300V (SC-15)	 ECSF-EZ
72	2E-30900-25	6	FUSE SC-20 TIME DELAY	ALL
73	2E-30901-12	4	FUSE HOLDER 600V 2 POLE	ALL
74	2E-31200-02	1	LUG GROUNDING UL APPROVED	ALL
75	2E-31400-07	1	XFORMR120-208-240/24V40VA	ECSF-EZ
76	2E-31400-15	1	XFRMR 480/24VAC	ECSF-ES-480V
77	2E-31400-26	1	XFORMR 208-240/24-12 40VA	ALL
81	2J-40102-25	1	DSPLY 320X240 DB170-001	
82	Q9-40102-70	1	MAIN BOARD, OCE/OCG	ECSF-EZ
83	2J-40102-51	1	CIRBD FILTER	ECSF-EZ
84	2J-40102-64	1	CONTROL - OCE/OCG	NOT ON THE ECSF-EZ
85	2E-40704-13	1	CAP - 5 MFD 370V AC	ALL
86	2E-41100-38 2E-41100-41	1 1	SENSOR TEMP OCE/OCG SENSOR TEMP OCE/OCG	 ECSF-EZ
87	2B-50200-103	2	RACK SLIDE OCE/OCG	ALL
88	2B-50200-20	6	RACK ECCO/GCCO OVEN	ALL
89	Q9-50312-02-1	2	DOOR CHAIN AND TURNBCKL	ALL

Fig No	Part Number	QTY	Description	Where Used
90	2P-51001-19	1	SPRING SWT DR HINGE EHS	ALL
91	2P-51001-38	2	SPRING VENT	ECSF-EZ
92	M-60301-162	1	LABEL PANEL OCE/G ENVIRO	ALL
93	2M-60301-166	1	LABEL PANEL OCE &G ENVIRO	ECSF-EZ
94	2M-60301-169	1	LABEL OCE ACCESS DR W/BUP	ALL
95	2K-70101-03	1	BRASTBEELBOW 1/4NPT-3/8CC	ALL
96	2K-70101-54	1	BRAS TBE UNION 3/8CCX1/4	ALL
97	2K-70302-36-1	1	PIPE NIPPLE 3/4NPT X 8BLK	ALL
98	2K-70302-53	1	PIPE COUPLING 3/8X1-3/16	ALL
99	2K-70303-03	2	PIPE COUPLING 1/4 NPT	ALL
100	2K-70305-05	1	PIPE 90° ELBOW 3/4 BLK	ALL
101	2V-70403-05	1	SOLENOID WATER	
102	2V-70403-07	1	SOLENOID PULL 24VAC	ECSF-EZ
103	Y9-70701-17-1	1	KNOB 450° B PHANTOM	ALL
104	2R-70701-45-1	2	BKKNOB RED TOP 6MM W/D	NOT ON THE ECSF-EZ
105	2K-70801-08 2K-70801-08	3 4	SNAP BUSH 1 3/4 SB1750-22 SNAP BUSH 1 3/4 SB1750-22	 ECSF-EZ
106	2U-71500-16	1	FAN - NCO 16 IN	ALL
107	2U-71500-17	1	FAN - NCO 6 IN	ALL
108	Q9-EH-502-1	1	TRIMLOCK 4	NOT ON THE ECSF-EZ
109	2T-30401-30	1	STAT FXD 550 DEG OPEN	ALL
110	Q9-30401-30-2	1	SWT KIT STAT FXD 550 DEG	ALL
NI	1P-72602-37	6	GSKT HITEMP OCE ELEMENT	ALL
NI	2H-60106-73	1	INSULATION KIT OCE - BODY	ALL
NI	Q9-146-724	1	SAFETY STAT ASSY	ALL
NI	Q9-146-749	1	WINDOW RING ASSY	ALL
NI	Q9-60102-006		Ferrite kit - OCE XFMR INPUT	

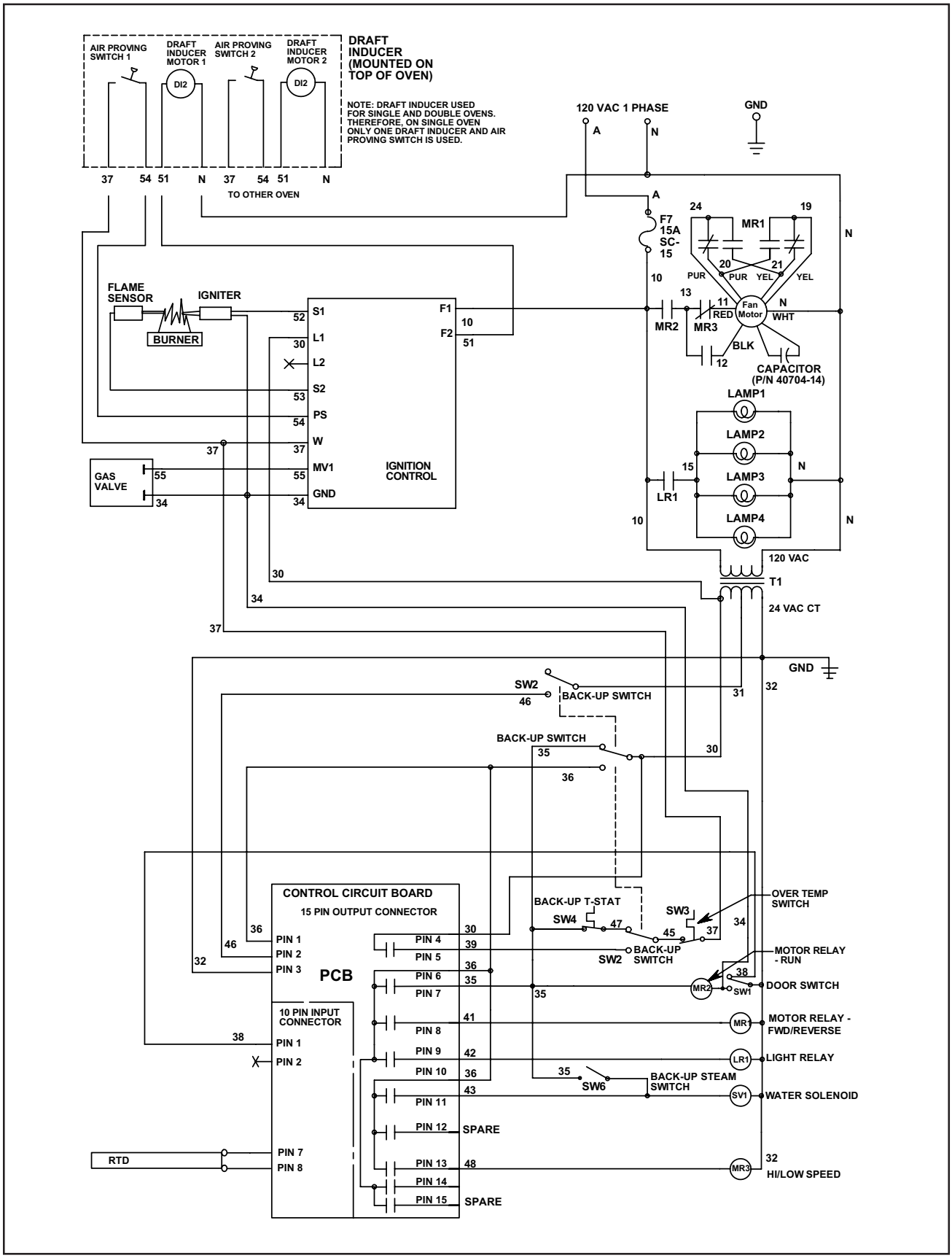
NI = NOT ILLUSTRATED

Fig No	Part Number	QTY	Description	Where Used
LAMP FIXTURE				
NI	2S-31602-08-1	4	250V BULB {FOR 31602-08}	480V Units
NI	2S-31602-09-1	4	130V BULB {FOR 31602-09}	208-240V Units
NI	2S-31602-08-2	4	LAMP GLOBES	
NI	2S-31602-08	4	LAMP FIXTURE RANGE W/250V	480V Units
NI	2S-31602-09	4	LAMP FIXTURE RANGE W/130V	208V-240V Units

NI = NOT ILLUSTRATED

NOTES

ENVIROSTAR WIRING DIAGRAM



CALIFORNIA REGULATIONS

WARNING

IF NOT INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, THIS PRODUCT COULD EXPOSE YOU TO SUBSTANCES IN FUEL OR IN FUEL COMBUSTION WHICH CAN CAUSE DEATH OR SERIOUS ILLNESS AND WHICH ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

The State of California enacted the California Safe Drinking Water and Toxic Enforcement Act of 1986, (Prop. 65), which 3 prohibits any person in the course of doing business from knowingly and intentionally exposing any individual to a chemical known to the State of California to cause cancer or reproductive toxicity without first giving clear and reasonable warning to such individuals.3 The Governor's Scientific Advisory Panel added carbon monoxide to the list of hazardous chemicals known to cause reproductive harm.

In order to establish full compliance with Proposition 65, we attached a yellow warning label to each gas fired unit manufactured by the Montague Company.

Carbon monoxide would not be present in concentrations that would pose a 3 significant risk3 to the consumer when the equipment is installed, operated and maintained as follows:

1. Installed in accordance with all local codes, or in the absence of local codes, with the current National Fuel Gas Code Z223.1, Latest Addendum.
2. Installed under a properly designed and operating exhaust hood.
3. Connected to the type of gas for which the unit is equipped.
4. Proper appliance pressure regulator installed on the gas supply line and adjusted for the manifold pressure marked on the rating plate.
5. Adequate air supply to the unit.
6. The equipment is operated in the manner intended using the proper utensil for that type of appliance.
7. Keep the equipment clean and have it checked periodically.
8. Burner air adjustments, mechanical maintenance, and repair procedures should be performed by qualified service personnel.

If the equipment is not installed, operated and maintained in accordance with the above, concentrations of carbon monoxide in excess of the established limits could be present in the kitchen environment.

ALL PERSONNEL IN THE WORKPLACE WHO MAY BE SUBJECT TO ANY EXPOSURE OF CARBON MONOXIDE MUST BE WARNED OF SUCH POSSIBLE EXPOSURE. THIS WARNING SHOULD BE CONVEYED IN A MANNER SO THAT IT IS CLEARLY UNDERSTOOD BY THE EMPLOYEE, AND THE EMPLOYEE SHOULD BE ASKED IF IN FACT HE OR SHE UNDERSTANDS THE CORRECT METHOD OF OPERATION OF THE EQUIPMENT AND THAT A RISK OF EXPOSURE EXISTS IF THE EQUIPMENT IS OPERATED IMPROPERLY.

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